The Mining Journal

Established 1835 — Railway & Commercial Gazette

Vol. CCXLVII No. 6317 — LONDON, SEPTEMBER 14, 1956 — PRICE 9d.

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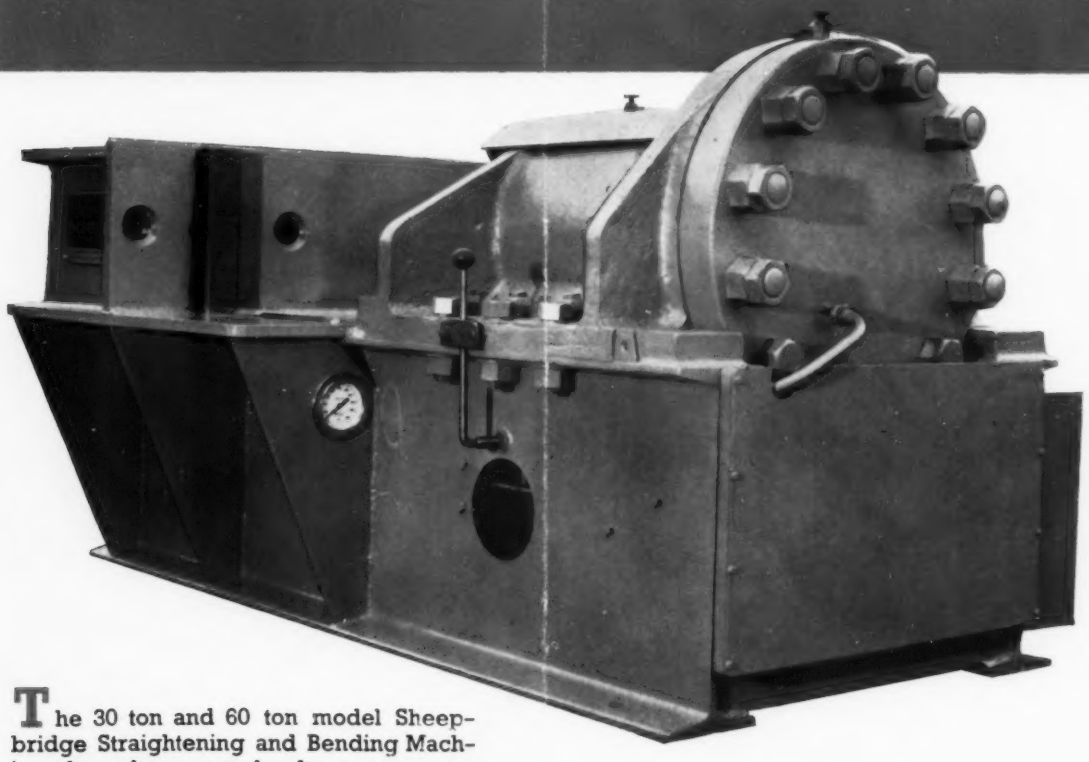

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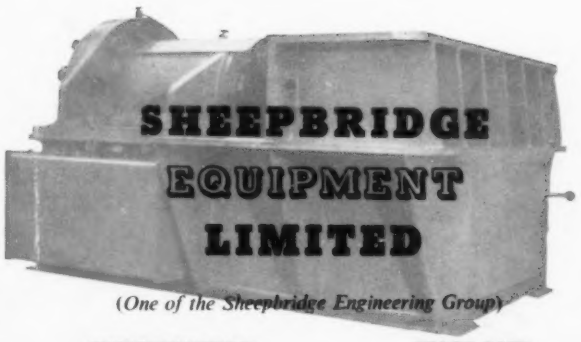

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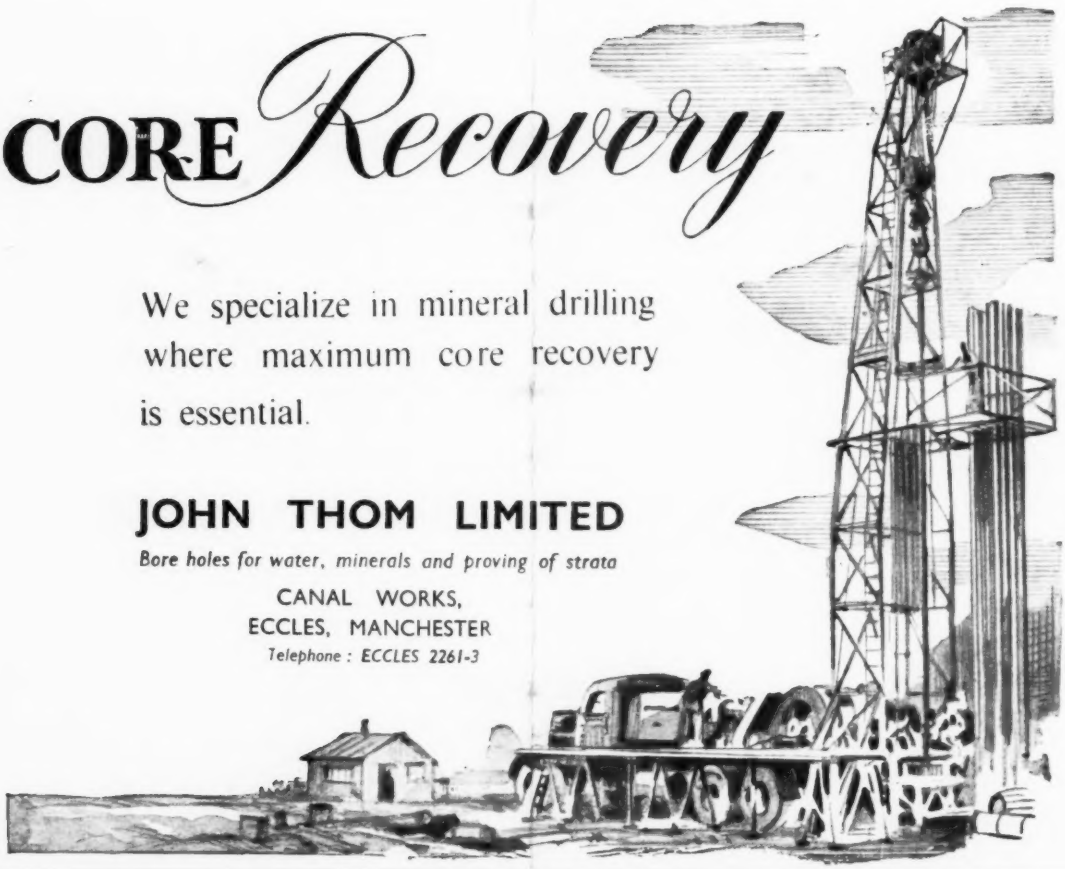

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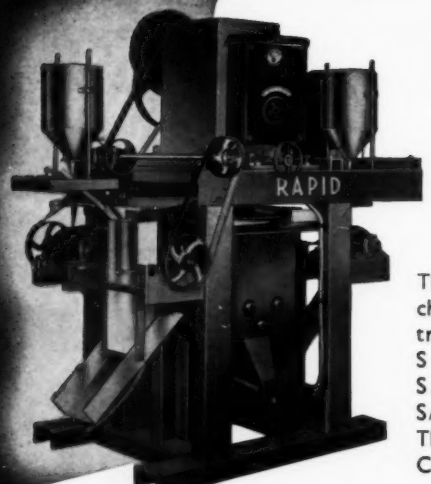

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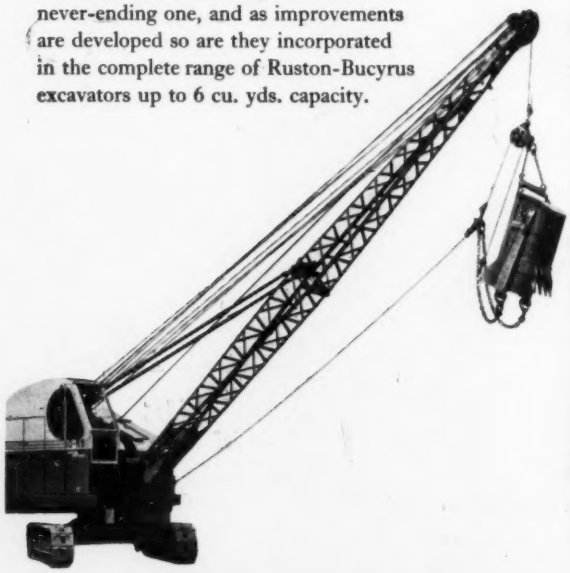

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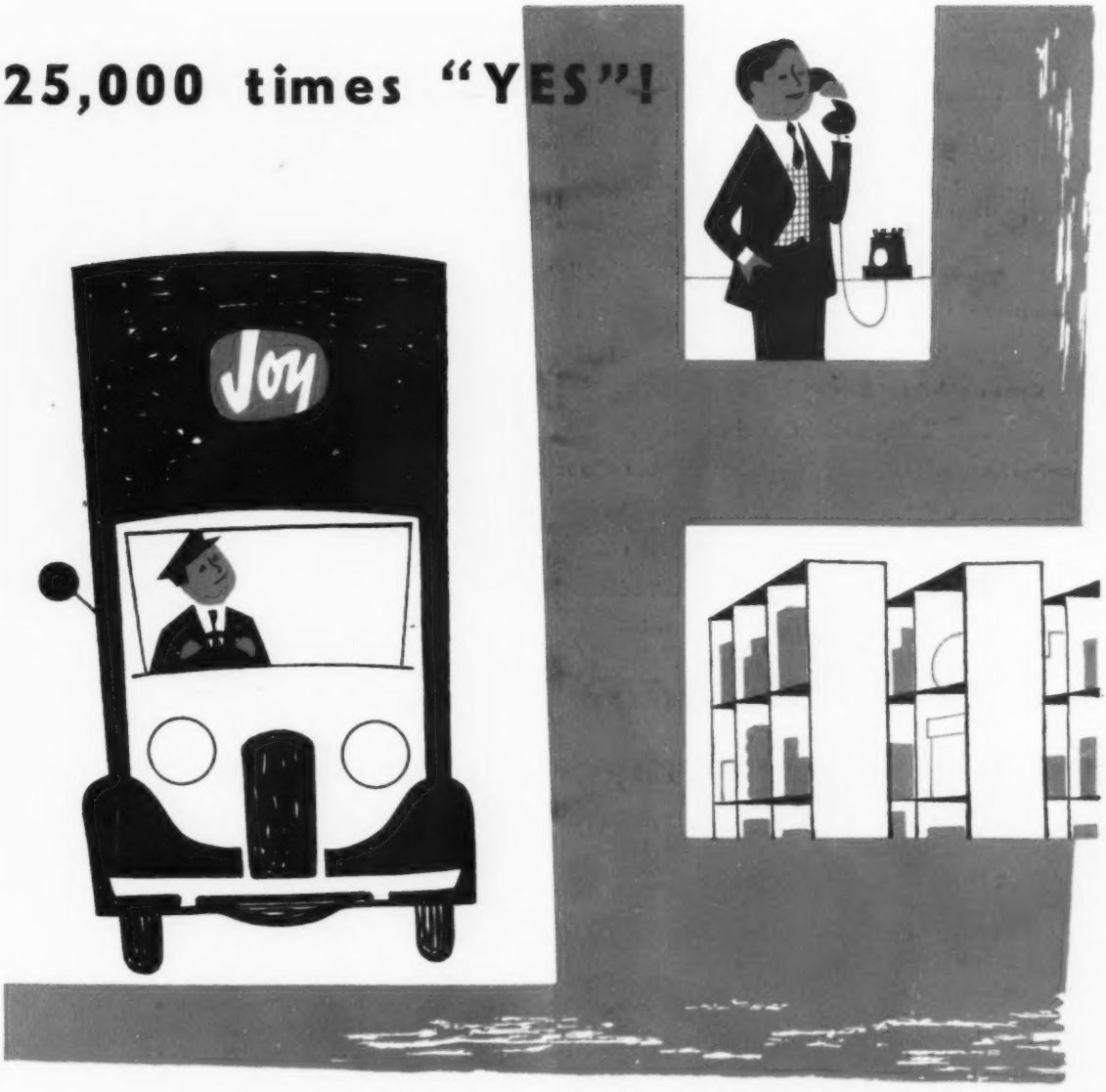

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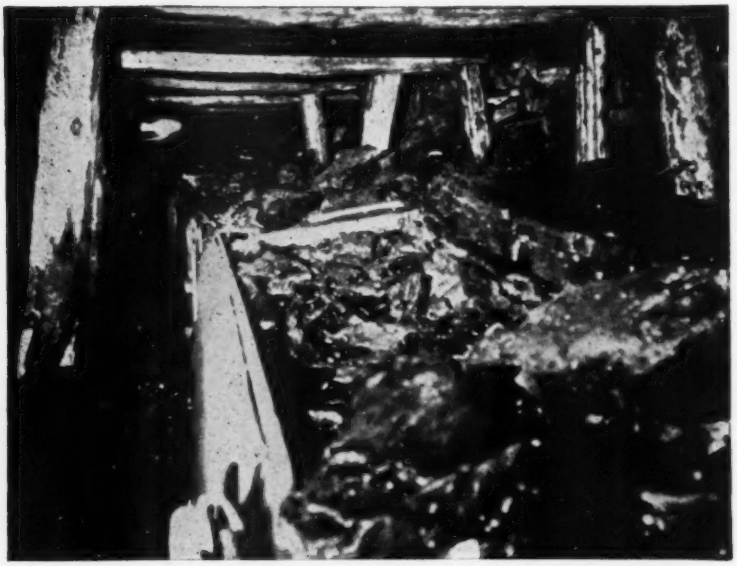

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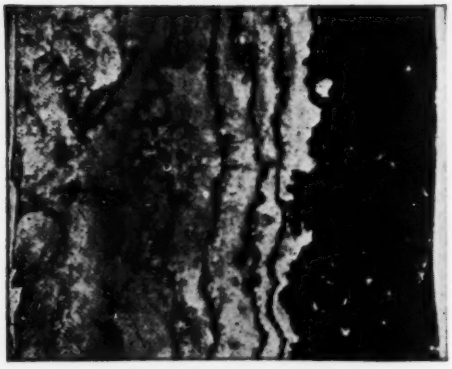
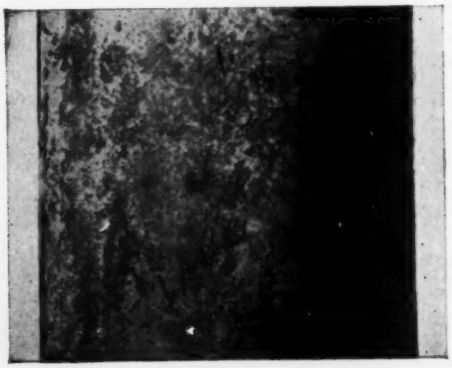


Above : 5-ply rubber. Below : 5-ply PVC belting. Both after 700 hours abrasive testing



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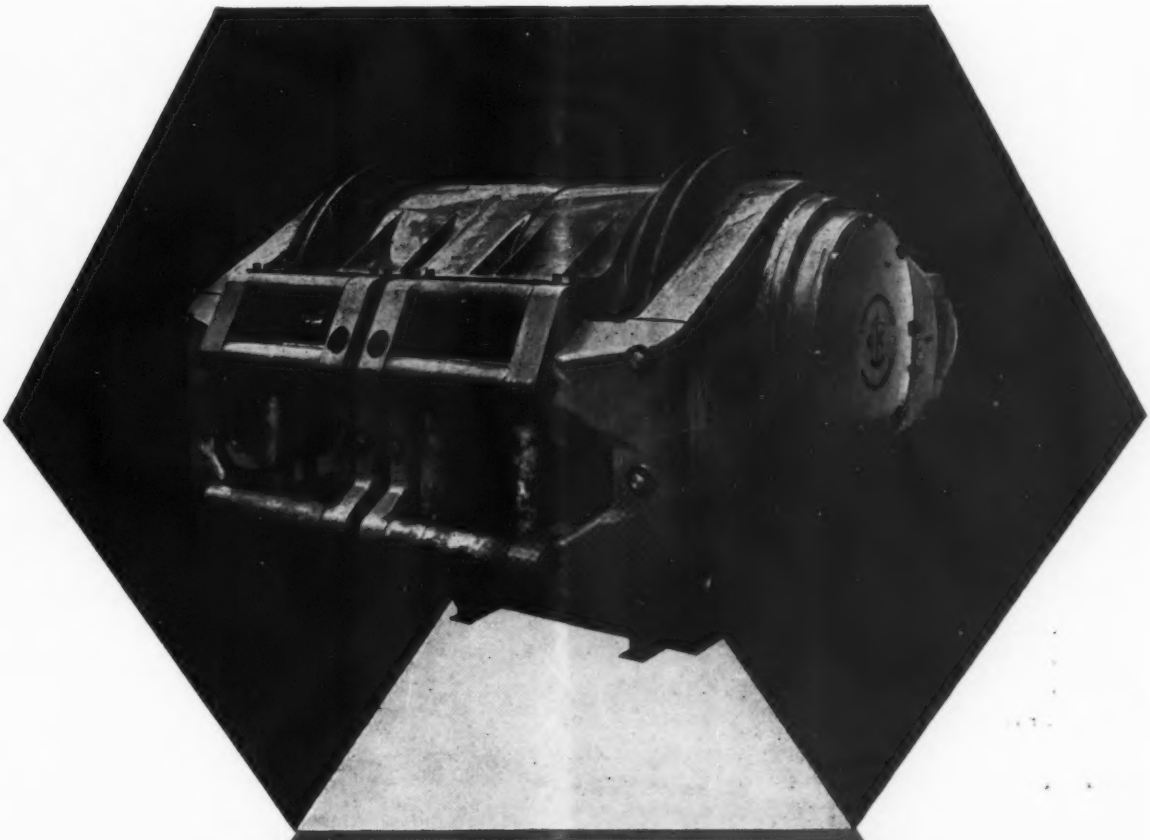

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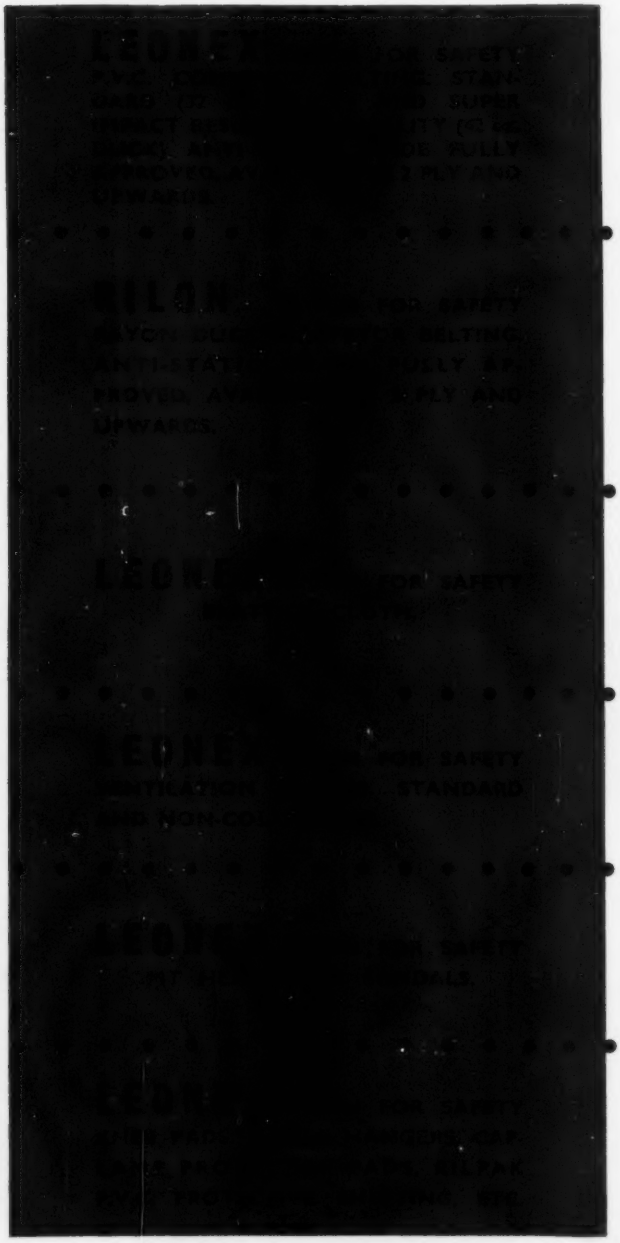

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The Mining Journal

Established 1835

Vol. CCXLVII No. 6317 LONDON, SEPTEMBER 14, 1956 PRICE 9d.

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NOTES AND COMMENTS

Nearer the Rainbow's End?

The South African Minister of Finance, Mr. Tom Naude, is on his way to Washington for meetings of the World Bank and International Monetary Fund on September 24. This is his first visit to Washington as Minister of Finance. Following in the footsteps of his predecessors, Mr. Havenga and Mr. Eric Louw, he will make the perennial South African plea, which has become as inevitable as a signature tune in a Wagnerian opera—give back its glitter to gold.

Legend has it that at the foot of the rainbow there is a pot of gold. But the rainbow always ends on the other side of the valley, beyond reach of the fleetest and most persevering seeker. Year after year—for longer than many investors care to remember—it has lingered transiently over Washington, until its glowing colours were rudely dispelled by the grey twilight of American intransigence.

An increase in the price of gold would obviously have a dynamic impact on the economy of a country whose gold mining operations last year resulted in a working revenue of £177,414,094 (excluding gold produced by non-members of the Transvaal and Orange Free State Chamber of Mines) and a working profit of only £44,252,990.

In his representations to the International Monetary Fund, Mr. Naude will be speaking not only for South Africa, but for the gold industry throughout the world. Producers in Canada, Australia and in the U.S. itself are no less victims of the relentless squeeze on profit margins resulting from the inflation of the past decade and a half, which has seen everything go up in price but gold. Indeed, the most bitter critics of U.S. gold policy have been the domestic producers, who consider that their industry has been shamefully treated by successive governments.

It is conceivable that even the pursuit of a rainbow, if carried out with sufficient resolution, might ultimately prove rewarding. This year there are rather more solid grounds for hoping that the International Monetary Fund may experience a change of heart, not through any belated concern for the pockets of hard-pressed gold producers, but because the narrowing gap between the American gold stock and the country's short-term liabilities to foreigners is at last beginning to attract attention within the U.S.

Despite record exports and a bigger trade surplus, the U.S. has continued to incur a deficit in its overall balance of payments, thereby enabling foreign countries to add to their gold and dollar holdings. Foreign short-term dollar assets, including deposits and U.S. Treasury obligations, now total around $14,500,000,000, equal to 66 per cent of the gold stock which currently stands at $21,800,000,000, compared with $24,600,000, equivalent to 31 per cent in 1949. The U.S. net reserves have, in fact, been reduced to roughly half the figure at which they were standing only seven years ago. The question is being asked how long the U.S. can afford to go on spending and lending abroad and piling up these potential claims against its dwindling stock of gold.

At present the gold stock is so large in relation to these short-term balances that more than two-thirds of the latter could, theoretically, be withdrawn and still leave enough gold to meet the statutory requirements of 25 per cent against Federal Reserve notes and member bank reserve deposits. Considering the need on the part of foreign countries to maintain adequate U.S. balances, this would appear to be ample cushion save under extreme panic conditions or in the event of another major war.

On the other hand, it is conceivable that the trend of recent years might continue until foreign short-term holdings exceeded the gold stock and the U.S. became vulnerable to a flight from the dollar. The well-known South African economist, Dr. W. J. Busschau, quoting banking figures published by the International Monetary Fund, showed recently that in 1937 the overall gold/paper ratio was about 40 per cent and if separate calculations were made for the U.S. and the rest of the West, the U.S. figure was somewhat higher than the figure for the rest. If a similar comparison were made now, the gold/paper ratio of the West, excluding the U.S., was just under 22 per cent, while the ratio for the U.S. was roughly 14 per cent. In other words, Dr. Busschau said, the U.S. was now probably less liquid than the rest of the West. In order to restore the liquidity of the West (as measured by the relation of gold to paper on the level of 1937), the gold price would need to be enhanced by more than 2½ times the present

price—that is, in the order of $90 an ounce or a sterling price of about £30 an ounce. Then South Africa would indeed have struck the jackpot at the foot of the rainbow!

Mr. Naude has undoubtedly a strong case and one which appears to be gaining a growing measure of support. We still believe that sooner or later the price of gold will have to be adjusted upwards. Nevertheless, having regard to the extreme rigidity of the U.S. government's attitude towards the gold price, we are by no means confident that in his westward journey Mr. Naude will arrive this year at rainbow's end.

The World Bank Spreads its Wings

Recognition of the dynamic power of competitive private enterprise in promoting economic development is implied by the formation of the International Finance Corporation, which was established in July, 1956, as an international financial institution with an authorized capital of U.S.$100,000,000. Of this total $78,400,000 has been subscribed by the governments of 32 countries. A number of other countries which are members of the International Bank for Reconstruction and Development (World Bank) are in the process of joining I.F.C. The corporation will operate as an affiliate of the World Bank, although it is a separate legal entity and its funds are entirely separate and distinct from those of the Bank.

I.F.C. is authorized to borrow funds by the sale of its own bonds or obligations, but it does not expect to make use of this authority in its early years. Hence the funds amount of the subscribed capital. The objective is to further economic development by encouraging the growth of productive enterprise in the member countries, particularly in less developed areas. I.F.C. intends to do this by:

(1) Investing in productive private enterprises, in association with private investors and without government guarantee of repayment, in cases where sufficient private capital is not available on reasonable terms;

(2) Serving as a clearing house to bring together investment opportunities, private capital (both foreign and domestic) and experienced management; and

(3) Helping to stimulate the productive investment of private capital, both domestic and foreign.

Investments eligible for I.F.C. financing are restricted to private enterprises, principally in the less developed regions, and will be made in association with private investors from the industrial countries and also from the less developed regions. The minimum investment proposal I.F.C. will normally entertain will be of at least $100,000 out of a minimum total investment required of $500,000. No upper limit on the amount of any single investment has yet been fixed, but as a matter of general policy the corporation will prefer to make a substantial number of moderate sized investments rather than to invest large amounts in relatively few individual projects.

Industrial, agricultural, financial, commercial and other private business can be considered, provided that their operations are productive in character, but I.F.C. intends to concentrate on industrial investment in its early years.

Mining, which is basic to economic development and demands large capital resources is a field which appears to offer particular scope for the Corporation's funds.

I.C.F.'s investments will not normally consist of conventional fixed interest loans, but will be on a basis approximating venture capital. The Corporation will expect to obtain financial results appropriate to the type of investment and also securities of contractual rights (e.g., rights to subscribe to capital stock or shares or to convert the investment into stocks or shares) of a character attractive to private investors. I.F.C. has no policy of uniform interest rates and the usual term of its investments will be from about five to 15 years. It cannot itself undertake the management of enterprises and will, therefore, invest only in those for which its private partners can provide experienced and competent management.

However I.F.C. will inquire into the procedure which is followed for the purchase or procurement of capital and goods and services, in order to satisfy itself "that its interest as an investor is reasonably safeguarded"—in other words, it can insist on contracts being subject to open tender, as at Kariba.

I.F.C.'s policy will be to revolve its funds by selling its investments to private investors when it can obtain a reasonable price for them. This policy is designed to serve the dual purpose of encouraging international private investment and of providing the corporation with funds for further investments.

Making Up For Lost Time in Steel

U.S. steel has made a quick recovery after the 27 day strike last month. Nevertheless, the return to full production has been governed by "the inevitability of gradualness". Furnaces and coke ovens can neither be stopped nor started by the mere turning of a tap: either is a process which cannot be hurried. Thus although a settlement of the dispute was negotiated by the end of July—incidentally on terms highly favourable to the already highly-paid workers—it was not until the third week in August that the pre-strike rate of production was fully restored.

In the meantime the total loss of output is estimated to amount to not less than 10,000,000 ingot tons or about 10 per cent of U.S. steel's record production of 104,500,000 tons in 1955. A further calculation of the effect of the new wage agreement is that the industry's total labour costs will be increased by £425,000,000 per annum, and although the big steel companies have accepted the responsibility of absorbing some of the increased wage costs in an effort to mitigate the inflationary effect of a price rise, an immediate advance of $8.50 (about £3) per ton has been announced.

Compared with the huge losses entailed by the American steel strike, the dispute with the craftsmen employed in British steel plants, which has entailed a loss of production amounting to possibly 400,000 tons, is a puny affair. No more than an embargo on overtime was involved, but by the process of attrition operation of the steel plants was slowed down considerably. On the appointment of a Court of Inquiry the disputants were besought to call off the embargo, but to this appeal they turned a deaf ear. And then a fortnight later came a complete *volte-face*.

The findings of the Court have yet to be published, but the embargo has been withdrawn, normal working has been resumed, and the industry has begun the steep climb back to the record production figures attained in the first quarter of the year. It will not be a task easy of accomplishment. Many of the skilled craftsmen affected by the dispute have found well paid work in other branches of industry, and their places have not been filled. The labour shortage is acute and is not only impeding the return to capacity working of existing plant, but is also delaying the completion of new equipment which was planned to come into operation during the closing months of 1956.

Meanwhile, the British Iron and Steel Federation, describes the general level of demand for steel as excessive and if there have been some shrinkages in the flow of orders for metal consumer goods, investment expenditure which accounts for more than 60 per cent of the steel requirements of British industry is continuing at an enhanced level.

Western United States

(From Our Own Correspondent)

Portland, Oregon, September 5.

Fortunately the grim prospects that appeared to be facing the non-ferrous labour situation failed to materialize and, even before the steel strike was settled, leading copper producers reached agreements with the principal union so that there was no interruption of operations. The new contracts cover a three year period without a reopening clause and provide for progressive increases to reach a total of 34 c. an hour at the beginning of the third year. Benefits to the workers include increased wages, improved pensions, health and welfare, and vacations. The successful negotiations stepped up the prestige of the Mine, Mill and Smelter Workers' Union which, since its expulsion from C.I.O. in 1950, has been subject to raids by United Steel Workers of AFL-CIO; in a recent vote at Anaconda operations in Montana over representation, Mine-Mill administered a three to two defeat on its rival. In view of the three year contract it is probable that Steelworkers will withhold further attempts at raiding, at least in the copper industry, for some time.

The controversial " farm bill," which finally was signed by the President, eases the mind of the mining industry in one respect, in that it provides that all commodities acquired by barter, in which minerals play an important part, shall go to the supplemental stockpile, from which they can be released only by joint resolution of Congress. Heretofore commodities received in barter for agricultural products were under the control of the Commodity Credit Corporation (Department of Agriculture), which had authority to dispose of them as it saw fit.

URANIUM IS BIG BUSINESS

The calibre of firms now participating in uranium development was commented on in a recent magazine article with the remark that they could " collectively outbid King Midas in a tight business deal ". Among those cited are Anaconda, American Smelting, Homestake, Phelps-Dodge, Climax Molybdenum, Union Carbide and Carbon, and a dozen or so others of like financial prestige which have gone in for uranium in a big way. Uranium is now big business and the small operator appears to be in danger of being squeezed out unless he allies himself with one of the larger companies.

Union Carbide Nuclear Co., formerly U.S. Vanadium Corporation and now a division of Union Carbide and Carbon, which was the first company to operate in the Colorado Plateau, is embarking on an extensive enlargement programme in that area. This includes a new and larger mill, two chemical upgrading plants and two receiving stations. In the Plateau, the Ambrosia Lake district, in north-western New Mexico, is currently receiving much publicity since results of extensive drilling campaigns were made public.

Most important development is that of Kermac Nuclear Fuel Co., a well financed organization with strong financial backing, which has completed a drilling programme indicating 5,000,000 tons of mineable ore in sight on its properties. Negotiations are under way with A.E.C. for a permit to build a mill and, in anticipation of increased production from this area the latter is opening a new buying station at Grants, New Mexico. Kermac is the largest, but only one, of many activities at Ambrosia Lake, which bids fair to become an important producing area. Possibly the designation of a " nuclear fuel corporation " has some significance as to the attitude of industry towards the future of uranium.

Texas-Zinc Minerals Corporation (Texas Oil Co. and New Jersey Zinc) which recently purchased the much publicized Happy Jack mine, is erecting a 400 t.p.d. mill in the White Canyon area in Utah.

Phelps-Dodge has acquired extensive holdings in the Crooks Gap field in Wyoming and presently has 14 drills operating with an ultimate aim of 68,000 ft. of hole. While Crooks Gap and the older Gas Hills fields have demonstrated large reserves production has not been large so far, partly because of limited quotas, which many of the companies are seeking to have liberalized. The case is cited of one company that has stockpiled ore worth $200,000 (extracted at a cost of $10,000) but cannot, under its quota, fully dispose of it for 14 months.

On the Spokane Indian Reservation, in north-eastern Washington, Dawn Mining Co. (Newmont) is building the first uranium mill in the State. Since the government plant at Hanford carries out the final processing of the uranium concentrates, the Spokane area will soon have a completely integrated uranium programme from ore to finished product.

A statement recently released from a government source estimates reserves of uranium ores in the country at 30,000,000 tons.

THE BASE METALS

Now that Anaconda has brought its Berkely pit to a production of 10,000 t.p.d., with expectation of reaching the maximum of 17,000 tons by the end of the year, it seems to be looking for more worlds to conquer in the Butte district. Two new projects now under intensive exploration in an area that has had little systematic prospecting heretofore may lead to another open pit operation and another deep shaft. Careful geological study indicates favourable ore possibilities and exploration is being carried on by drilling and by crosscutting from the 3,000 and 3,300 levels of the Belmont and Leonard shafts.

In the Shasta copper district in California, once a leading producer, the activity in copper has brought about a revival of some of the older producers, notably Mountain Copper Co. which, for some years past, has restricted its operations to underground mining of pyrite for its acid plant and is now developing an open pit for copper ores. Another copper mine appears to be in the making in Pima County, Arizona, in the same general locality as the Pima mine, which is notable as having been discovered originally solely by geophysical exploration. Now Duval Sulphur and Potash Co., after a year of exploration at a cost of $500,000, has demonstrated ore reserves of approximately 80,000,000 tons averaging 0.8 to 0.10 per cent copper and is planning development on the basis of an annual output of 21,500 tons of copper. As at Pima the deposit is masked by alluvium but, with this removed, is amenable to open pit operation.

Newmont and A.S. and R. are combining forces in the Leadville, Colorado district and will operate their various properties as a unit under the management of Resurrection Mining Co., a Newmont subsidiary. The Resurrection mill has been overhauled and brought up to a capacity of 400 t.p.d. The properties of the two companies are so situated that joint operation can be carried on to advantage.

Bunker Hill Co. (formerly Bunker Hill and Sullivan) is expanding its electrolytic zinc plant in the Coeur d'Alene district in Idaho from 4,800 to 7,200 tons per annum capacity at an expenditure of $7,000,000. The company has adopted a policy of divesting itself of all activities not directly involved in the production of metal and its negotiating a sale of its electric generating plant and its housing facilities.

Can Britain Afford to Neglect Newer Metals?

We stand to-day on the threshold of a new and exciting era of technological conquests. The time may not be far distant when a substantial proportion of the world's energy requirements will be generated by atomic fission or thermonuclear fusion, and when supersonic flight will become as commonplace as yesterday's wonder, television. Is Britain lagging behind the U.S. in the development of such metals as lithium, zirconium and beryllium, which have important nuclear properties? What are we doing about high temperature metals such as molybdenum, columbium and cobalt—keys which may unlock the heat barrier and open a new chapter in the history of supersonic flight?

MINERALS POLICY IN THE U.S.

The U.S. Administration has a positive minerals policy, backed by the statistical and research facilities of the Bureau of Mines. No expense is being spared to ensure an adequate and dependable supply of materials from indigenous or overseas sources for the requirements of both industry and defence. In accordance with this policy the Foreign Minerals Region of the Bureau of Mines was set up to explore and investigate foreign deposits and provide technical assistance for their development. A high priority is accorded in the Administration's programme to materials having the special properties or combinations of properties which are demanded by designers of nuclear reactors, guided missiles and jet aircraft.

Vast sums are being spent on research and development of new materials, both by the U.S. Government and by commercial firms. The machinery established by the Bureau of Mines has encouraged prospecting and exploration for the minerals from which the newer metals are derived. This has led to the discovery of major occurrences both at home and abroad. American interests are actively associated with the exploitation of extensive mineral deposits in many parts of the world, including many Commonwealth territories.

The efforts of the U.S. Administration to accelerate the development and production of new materials have already resulted in the completion of various stockpiling programmes, for ores and concentrates (with unfortunate consequences for overseas suppliers, as in the case of columbite-tantalite) and in the establishment of reduction and fabricating facilities on an increasing scale. In a number of instances increasing quantities of the newer metals are becoming available for commercial users after government requirements have been met.

THE CASE OF ZIRCONIUM

Zirconium is an interesting example of the pattern of development in the U.S. which is leading to the emergence of the newer metals as industrial materials. Because of its strength and corrosion resistance, plus the fact that it does not trap neutrons needed to sustain a chain reaction, the Atomic Energy Commission became interested in zirconium as a structural and cladding material for atomic reactors. Volume production of the metal was developed through research begun by the Bureau of Mines in 1945 at its laboratory in Albany, Oregon. Metallurgists at Albany adapted the Kroll process, already used in making another new metal, titanium, to recovery of zirconium from its ores. The Albany laboratory also perfected the process now used by industry to make zirconium ingots from "sponge" obtained in the Kroll reaction, and has introduced new techniques for fabricating finished metal into usable shapes.

Aided both technically and financially by the A.E.C. and the Navy Department's Bureau of Ships, scientists at Albany engineered output of zirconium from 1½ s.tons a year in 1948 to nearly 150 tons in 1953, when private industry entered production under a long-term contract with the A.E.C.

When the Bureau of Mines began producing zirconium, the metal could be purchased only in small quantities and cost about $70 a lb. To-day, reactor-grade sponge metal made by the Bureau process sells for about $14 a lb. Because of its chemical inertness and high resistance to corrosion, zirconium has applications in surgery, the chemical industry and other fields, but the high price of the metal has limited its use. A few months ago contracts calling for annual delivery of 1,100 s.tons of zirconium over a five-year period, at an average cost of $14,000,000 a year, were signed with three major producers by the A.E.C., and provide for very rapid tax amortization. Bids by the successful companies were in the range of $6 - $7 per lb. All three companies are building new plants to handle their contracts and each plant will have an initial capacity of 750 tons a year—well in excess of the contracted amounts. The surplus capacity is intended for the production of zirconium for commercial atomic plants and for non-atomic work.

BRITAIN'S LESS POSITIVE APPROACH

Great Britain, for both industry and defence, needs increasing supplies of nearly all raw materials as her economy expands, but the development of mineral resources, which calls for long-term planning, is handicapped by the absence of a positive policy based on a continuous and comprehensive survey of user demands. The government promised that careful examination would be given to Lord Bruce's plea in the Lords for an imaginative scheme for the development in the British Empire of resources of vital raw materials. There has been no further announcement, however, and meanwhile we continue to lose ground in the world-wide scramble for minerals. Not the least disturbing aspect of the situation is the limited attention apparently being accorded to the newer metals as a whole.

With one or two notable exceptions, commercial development of the newer metals seems to have made little or no headway in Britain although the minerals from which they are derived are available in very large quantities from Commonwealth sources. Is this due to the absence of government encouragement during the costly initial development period, to the allegedly conservative outlook of British industrialists, or to a fiscal climate which is unfavourable to long-term development projects involving a high degree of risk? Whatever the reason, it behoves us to be very certain that in neglecting the newer metals and even, in some instances, the minerals from which they are derived, we are not jeopardizing British leadership in the jet aircraft and nuclear fields.

Zirconium sponge and ingot has been produced in the U.K. on a pilot plant scale for several years by Murex Ltd. In fact, it was in the U.K. that zirconium first became available for general use outside the atomic field. General development has been hampered by the high cost of the metal, however, as it would have been in the U.S. had the A.E.C. not overcome this difficulty by placing a long-term contract for the production of the metal in quantity.

According to a recent announcement, the U.K. Atomic Energy Authority may not require zirconium in the large quantities which had previously been thought necessary. Unlike the American *Nautilus* and *Sea Wolf*, Britain's

atomic submarines may not use exceptional amounts of this expensive material, due to the development of new types of steel and aluminium alloys. It is none the less possible, as indicated by the chairman of Murex, Sir Arthur Smout, in his annual address to shareholders, that a large-scale demand for zirconium for nuclear purposes might arise in the U.K., as it has already arisen in the U.S. Meanwhile, the company is contracting for the sale of the bulk of its output of zirconium from its expanded pilot plant for the next three years.

Murex are also actively engaged in pioneering the development in Britain of other less common metals, which will assuredly be in growing demand for nuclear power applications and for use in the expanding field of electronics. Development work on the extraction and production of a wide range of these metals is proceeding at an accelerated pace. Niobium is a metal of particular interest and importance to the designers of nuclear reactors and may also become an important constituent of high temperature materials for use in the gas turbine engines of high speed jets. There has been a small but satisfactory increase in the demand for tantalum, in the form of rod, sheet and fabricated parts, from chemical engineers wishing to avail themselves of its high resistance to corrosive chemicals, and there is also a growing use for this metal for high capacity electrical condensers.

While Murex are expanding the capacity of their existing pilot plants for zirconium and tantalum/niobium, detailed design work based on practical operating experience is, at the same time, proceeding on new large-scale plants, so that these could be built at short notice if events proved their construction to be justified.

In the case of titanium, research on problems of aircraft design was unquestionably hampered in the early post-war years by difficulty in obtaining supplies from the U.S. even in the limited quantities required for laboratory research. Britain had an opportunity of pioneering the development of the Kroll process, now used for the production of titanium on a commercial scale, when the government was approached by Dr. W. J. Kroll, early in the second world war. The Ministry cannot fairly be blamed, however, for turning away the inventor of the Kroll process at a time when its technological resources were heavily committed on projects of a more urgent nature. On the other hand, it is hard to find a convincing explanation for the long time-lag between the end of the war and the eventual rapid development of commercial production in the U.K.

IS LITHIUM BEING IGNORED?

Two Commonwealth countries, Southern Rhodesia and Canada, possess the world's largest known deposits of lithium-bearing minerals. Lithium is reputed to be a key material in the fusion reaction, from which the hydrogen bomb derives its power. It is understood that lithium metal and its various derivatives are now being purchased in large quantities by U.S. Government agencies for use in the field of high energy chemical fuels. This is regarded as an indication that the huge energy potential and light weight of lithium and boron compounds, combined with hydrogen, have been successfully harnessed as propellants for various types of rockets, guided missiles, and principal and auxiliary devices for supersonic jet aircraft. The lightest of all metals, lithium is also coming rapidly to the fore in the U.S. as an industrial material with a growing field of applications. Among the many industrial projects for which it is used are alloys, enamels, soaps and greases, pharmaceutical products, synthetic rubber and ceramics with promise of applications in refrigeration and air conditioning.

Yet we know of no attempt to develop the production of this useful metal in the U.K., despite its immense strategic importance as a potential thermo-nuclear fuel. The U.S. is by far the largest purchaser of lithium-bearing minerals from Commonwealth sources. Though the Bikita deposits in Southern Rhodesia have been developed by British capital, Rhodesian ores are being processed at San Antonio, Texas, by an American company jointly owned by the American Potash and Chemical Corporation and Bikita Minerals Ltd. With few exceptions manufacturers in the U.K. have displayed little interest in lithium's industrial uses.

YEARS THAT THE LOCUSTS EAT

Neglect of some of the newer metals cannot be attributed to lack of technological skill, for British achievements are second to none when the need is sufficiently great. For example, co-operation between government and commercial laboratories in the U.K. led to the economic recovery of germanium from flue dusts and the production therefrom of high purity material for use in electronics. This notable example of co-operative research had its genesis in a critical shortage of high-purity semi-conductor materials for use in transistors and rectifiers. No less outstanding was I.C.I.'s achievement, within a remarkably short period, in catching up with U.S. know-how in the difficult field of titanium extraction and providing Britain with the cheapest titanium metal in the world.

The Commonwealth is a substantial producer of beryllium ores, but our requirements of beryllium metal and alloys are met by importation, principally from the U.S., although beryllium copper is a firmly established material with an assured market in the U.K. Why are we content to supply beryllium to the U.S. in the form of ores and import beryllium alloys that we could produce ourselves therefrom?

Since the war Britain's metallurgists and engineers have shown a very marked capacity for catching up with the years that the locusts eat and putting their country in the vanguard of technological progress. But why should these years be lost? Why should we wait till the need becomes sufficiently urgent before embarking upon the development of the newer metals for commercial use? Why should it be left to one or two far-sighted firms to plough lonely furrows in pioneering the development of metals that may become critically important a few years hence?

It is, of course, evident that with its limited resources and manpower, the U.K. cannot afford to undertake the development of new metals on such a large scale and on so broad a front as the U.S. Moreover, having regard to the tendency of many British firms to be secretive about research and development projects, it seems by no means improbable that there is more work in progress than annual reports reveal. Even so, it is difficult to escape the conclusion that producers and users generally are tending to display excessive caution in their approach to the newer metals. One result of the time-lag is that in many instances the most convenient reduction processes are fully covered by U.S. patents, with the result that U.K. firms contemplating production are faced with the alternative of paying dollars in royalties to an American company or developing a new and possibly less economical process with further loss of time.

It is paradoxical that in the U.S., with its traditional predilection for private enterprise, the government through its own research and development programmes and through the award of long-term contracts under attractive amortization terms, is bearing much of the cost and risk involved in the establishment of new metals as commercial materials. On the other hand, Britain, the so-called Welfare State, prefers to let private enterprise nurse the costly and rather unpredictable infant metals at its own risk.

There can be no objection to the principle of leaving new fields to private firms, provided that the economic climate is sufficiently favourable to encourage enterprise, but the existing burden of taxation is hardly conducive to long-term projects involving considerable risk capital.

WHAT CAN BE DONE?

In principle, mineral producers in the Commonwealth would doubtless welcome the development of markets in the U.K. and the Dominions for the newer metals—more especially those that can be recovered as by-products from existing operations. Such a broadening of demand would provide greater stability by making demand and prices less sensitive to the vagaries of U.S. Government buying policy. The initiative might come from the user—as happened with germanium and could conceivably happen with niobium if technological requirements led to a sudden surge in demand. More frequently, however, it is through the efforts of producers themselves that markets are found for new metals or new markets for established metals.

There is little incentive to spend time, energy and capital in pioneering new materials, when by far the largest beneficiary is the State. By contracting to purchase much of the output, as in the case of titanium, the Ministry of Supply is willing to play Fairy Godmother to the extent of assuring the pioneer producer of a stable demand during the early years (at the same time providing for its own minimum requirements at no risk to itself), but failing suitable incentives in the form of tax amortization, government contracts are not in themselves sufficient to encourage the ploughing of lone furrows in comparatively unknown fields.

PROVISION OF RISK CAPITAL

Quite apart from the difficulties arising from shortages of manpower and limited financial resources, it is evident that until the provision of risk capital is accorded more favourable treatment, Britain will lag behind the U.S. in the production and utilization of the newer metals. We shall go on exporting minerals to the dollar area and spending dollars in buying metals extracted from Commonwealth ores. Meanwhile, American interests continue to become more closely associated with the exploitation of the Commonwealth's minerals and already control most of the sources from which certain new and important metals are derived.

Dare we let it go on? On the other hand how can we prevent it?

Developments in the U.K. Coal Mining Industry

The following article maintains our practice of presenting current developments in the coal mining industry of the United Kingdom. These developments were instigated both by manufacturers and by personnel employed in the collieries of this country.

One of the most common methods of carrying coal from various points underground to the surface is in mine-cars of some 2½ to 5-ton carrying capacity which, due to their size, need to be handled mechanically. Of the mine-car handling schemes incorporating electrical equipment supplied by The British Thomson-Houston Co. Ltd., recently commissioned, perhaps the most interesting is that installed at Thornhill Colliery, Yorkshire.

At this colliery each cage holds one mine-car of 2½-ton capacity. When the cage carrying a loaded mine-car is at rest at pit top the operator moves a control lever causing an electric ram to move forward, pushing an empty mine-car into the cage. This empty mine-car forces the loaded mine-car out of the opposite side of the cage and down an incline into a tippler where it is held firm by means of tippler catches. As soon as the car is located in the tippler a limit switch is closed, initiating the automatic tipping operation. The coal from the tippler passes down a chute on to a slowly rotating circular table from which it is transferred to a conveyor belt and hence to either the washery or storage bunkers.

After tipping, the tippler catches are lowered and the mine-car ejected from the tippler by means of another electric ram. This second ram is interesting inasmuch as it is powered by a changepole two-speed motor. By this means the ram approaches the mine-car at slow speed, but once the car and ram are moving together, the motor is switched to high speed. This enables the ram to travel at quite a high speed for most of its stroke, thereby saving time and also imparting considerable momentum to the car so that it can travel "free" until it is brought to rest on a traverser or moving platform. The traverser, running on inclined rails, carries the mine-car to a position in line with the next cage to arrive at the surface, and at the same time elevates the car so that it gravitates from the traverser coming to rest against rail stops next to the shaft. The empty car is then ready to be rammed into the cage, and the cycle is complete. The traverser is also automatic, starting to move as soon as the mine-car is located in position, and stopping opposite the correct cage.

A tool intended to replace pliers in the hands of belters when extracting pins at the coal face has been designed at Leicester. The tool has solid jaws, to the upper of which is attached a pivoted tooth, hinged backwards into the jaws. When in use, the tool is manoeuvred so that the pin to be extracted lies between the edge of this tooth and the lower jaw. A pull on the tool causes this tooth to pivot, gripping the pin; an increase in the pull tightens the grip until the pin is extracted.

To ensure a good grip, milled edges are provided on the two surfaces in contact with the pin. Two finger hooks are embodied in the handle to ensure that the user obtains a good grip on the tool.

A supporting fitting specially designed for use with Dunelm Circular Fluorescent Lighting fittings used for coal face lighting has been invented at Bates Colliery, Northumberland. It can be used independently of the conveyor structure and adapted for most heights of seam and most kinds of snaking conveyor structures.

The main support is a length of 1½ in. pipe, mounted on a square base. A "U" shaped piece of 3½ in. x ¾ in. flat is drilled to take this pipe and welded to it. A length of 2 in. pipe with lugs welded on is used to carry the lamp. This slips over the 1½ in. pipe and is positioned by means of slots which fit over a ½ in. pin in the 1½ in. pipe.

A "stop" is fitted to prevent the lamp being turned more than 270 deg. and a ¼ in. cotter prevents the lamp being lifted clear of the stop. The bracket as a whole is bolted by means of two bolts through the "U" piece to a specially adapted spill plate, the spill plate providing cover for the lighting cable which runs in a channel welded to the spill plate. The main feature of the bracket is that the lamp can be turned to shine in any one of four positions in a matter of seconds and yet remain rigid at all times.

Mining Developments in Greece

By E. A. BELL

The Greek industrialization and investment programme, as announced on June 21, 1953, by M. Markesinis, then Minister for Co-ordination, gives considerable prominence to mining as an industry based on the wealth of natural resources available both in various regions of the mainland and also on a number of Greek islands. Starting in 1954, the programme originally called for an expenditure equivalent to $235,000,000, and this commitment has compelled successive governments to enlist large-scale foreign co-operation. In this connection it is noteworthy that Western Germany has played a leading part in the accomplishment of a number of mining schemes. A re-drafted investments programme for the 18-month fiscal year from July, 1955 to December, 1956, was recently announced. Discussions have been in progress between the Greek government and the American ambassador to decide the total of U.S. economic aid to Greece in the next financial year.

PRINCIPAL MINING PROJECT

The principal mining project is the development of the Ptolemais lignite deposit with reserves conservatively estimated at some 250,000,000 tonnes. This deposit is located in Western Macedonia, 23½ miles to the north of the town of Kozani, on the new railway connecting Kozani with Florina in the north. The initiator of the scheme is M. Athanassiades Bodossakis, the well-known Greek industrialist and financier, who has been described as the real master of Greece's economic activities at the present time. As a result of his efforts West German industrial interests, headed by Krupps and including, *inter alia*, firms specializing in the construction of excavating and transport machines —such as Klochner-Humboldt-Deutz, of Cologne, and Hanomag—are members of a group formed to succeed Hellenic-American General Lignite Products Co., Inc., the original concessionaires of the Ptolemais area.

The Greek Chemical Fertilizer Company, the contractors for the development of lignite at Ptolemais, has paid, on behalf of the State, $550,000 to the Hellenic-American company which has waived its rights. An operating company known as the Ptolemais Mining and Industrial Company has been formed by M. Athanassiades Bodossakis.

In addition to the development of the mines, the scheme envisages in the initial stage the erection of a briquette works (capacity 200,000 tonnes per annum), a carbonization plant, a nitrate fertilizer plant (annual capacity 36,000 tonnes), and a thermal power station (65,000-85,000 kW.) burning lignite. This entails an expenditure estimated at $20,000,000. Credits granted by West Germany to Greece on the basis of an agreement signed in November, 1953, include 113,475,000 marks for the Ptolemais lignite project. No conclusive decision has been reached by the Greek government but tenders have been called for and the Greek Chemical Fertilizer Co. recently submitted a final survey to the Ministry of Industry to be approved or rejected.

West Germany has also granted credits of 18,937,000 marks for the further development of the Larymna iron and nickel mines (opened in 1909), which is another major project. These mines are owned by M. Bodassakis through Société Internationale des Mines. The average content of the ore is 1 per cent and the maximum 3 per cent. In 1953 a new plant capable of treating 130,000 tons of ore per annum was supplied by Krupps, who are prominently associated with this scheme. More than 80,000 tons of nickel ore was mined in 1955, most of it being exported to West Germany, either in the form of ore or as metal. The scheme also provides for four smelters, one of which has started operations and will eventually produce 160-170 tons of nickel iron (6-7 per cent nickel content) per day. The inauguration of this plant will take place later this year.

An American concern has purchased the shares of the Greek Bank of Chios and with them the shares of the Atlanti mining company which owns and is exploiting the richest iron ore on the island of Tsouca. The deposits have been estimated at 10,000,000 tonnes and the mine, which will employ 500 men, is expected to ship 300,000 tons a year to Western Germany.

Rich deposits of bauxite are found in various regions, but this wealth, too, requires to be developed. Greek bauxite has been mined since 1935, the 15 most important mines (at present being worked to 80 per cent of their capacity) are situated near Eleusis on the coast, some nine miles to the west of Athens. The only shareholder of the Eleusis Mining Co. is its founder, M. Dmitri Skalistiris. Eighty per cent of the bauxite mined in Greece is consigned to the Vereinigte Aluminium Werke at Bonn, West Germany, the balance being shared between the U.K. and Norway. In July, 1955, it transpired that Vereinigte Aluminium Werke, jointly with a Swiss aluminium group, had purchased from Canadian owners three bauxite mines situated near Delphi, some 90 miles northwest of Athens, which had not been worked since the second world war. Bauxite deposits on Euboa Island are also being developed, but production has not yet started. Lack of electric power has prevented Greece from establishing an aluminium industry.

The output of lead and silver by Compagnie Francaise des Mines de Laurium (southeast of Athens) has been stabilized in recent years. In 1955 Greece produced 2,724 tonnes of lead metal and 64,500 oz. of silver. The corresponding figures for 1954 are 2,876 tonnes and 70,200 oz. After more than 2,000 years, the historic Laurium mines, which gave commercial supremacy to classical Athens, are to be expanded and re-worked, using the most modern techniques. The ancient Greeks are believed to have extracted more than 2,000,000 tonnes of argentiferous lead ore from the Laurium deposits.

ATOMIC ENERGY

The chairman of the Greek Atomic Energy Committee, Admiral Spanides, recently discussed with the Minister of Industry and Commerce a Bill concerning the search for uranium and the future of atomic energy development.

Nothing further has been heard of the uranium deposits alleged to have been located in Western Thrace in 1953, or of a rich deposit of manganese ore which was said to have been discovered near Andritsemis (Patras Province) in the northern Peloponnes in 1954.

Efforts to locate mineral oil deposits have so far been unsuccessful, but prospecting is still being undertaken in Epirus and in the Peloponnes (both regions in which the Bank of Greece owns prospecting concessions), and also in Western Thrace.

To ease the supply position in regard to mineral oil products, the Greek Government is building an oil refinery (throughput 1,300,000 tonnes of crude per annum) at Aspropyrgos on the coast, 15 miles west of Athens. Credits granted by West Germany include 59,910,000 marks for the Aspropyrgos-Athens refinery.

Africa's Growing Share of World Mineral Production

Africa's share in world mineral production is analysed by the United Nations Department of Economic and Social Affairs in a report entitled "Economic Developments in Africa 1954-55", which has been published as a supplement to World Economic Survey, 1955. (H.M.S.O., price 11s. sterling, $1.50).

Mineral production in Africa was at a higher level in 1954 than in 1953 and continued to increase during the first half of 1955 compared with the corresponding period of 1954, mainly on account of higher export demand arising from increased industrial activity in Europe throughout the period and in North America commencing in the last quarter of 1954. The report does not cover the second half of 1955, but despite this doubtless inevitable time-lag, it constitutes a valuable survey of the growth of economic activity in Africa, from which current trends and problems can be more clearly discerned. It is, in fact, one of several studies intended as background for discussion of the world economic situation at the 22nd session of the Economic and Social Council at Geneva this year.

ROLE PLAYED BY THE UNION

In the Union of South Africa, the total value of primary mineral sales increased from £SA210,000,000 in 1953 to £SA228,000,000 in 1954, mainly on account of a rise in the volume of production, particularly of gold (table below). In the Belgian Congo, the volume of mining output expanded by about 5 per cent in 1954, compared with 1953, and in Rhodesia and Nyasaland an increase of 4 per cent in volume was recorded. The index of mineral production rose by 8 per cent in French Morocco in 1954 and in Tunisia by 3 per cent, but there was a slight decrease in production in Algeria. For Africa as a whole, significant increases occurred in 1954 in the output of antimony, bauxite, cobalt, copper, gold, lead, nickel, tungsten and phosphate rock. On the other hand, production of iron ore, tin and zinc declined.

In the first half of 1955,, mineral production in the Union of South Africa continued to increase, the value of mineral sales totalling £SA120,100,000 compared with £SA110,500,000 in the corresponding period of 1954. In Algeria, Morocco and Tunisia indices for the first half of 1955 rose substantially above the level of the corresponding period of 1954. In Rhodesia and Nyasaland production declined, however, owing to the prolonged strikes at the copper mines.

SHARE IN WORLD PRODUCTION OF SELECTED MINERALS

(Percentage of world output)*

Commodity	1952	1953	1954
Metallic mineral ores (metal content):			
Antimony	27.7	23.8	41.7
Bauxite	1.7	3.6	4.2
Chrome	37.4	37.0	40.3
Cobalt	85.0	83.5	80.9
Copper	23.8	25.9	27.3
Gold	55.7	56.5	58.7
Iron	5.0	5.0	5.1
Lead	11.1	11.1	11.9
Manganese	43.3	37.2	36.0
Nickel	0.8	1.0	1.0
Silver	5.0	5.1	4.7
Tin concentrates	13.8	14.4	13.9
Zinc	7.4	8.9	8.0
Non-metallic minerals:			
Asbestos	19.6	17.1	17.5
Coal	2.7	2.8	3.0
Diamonds	98.5	98.4	98.6
Phosphate rock	32.3	28.3	32.1

* Excluding output of the Union of Soviet Socialist Republics; excluding that of China also, in the case of antimony, gold, coal and iron ore; of Czechoslovakia for antimony and silver; and of Rumania for gold and silver.

INDICES OF VOLUME OF MINERAL PRODUCTION, SELECTED COUNTRIES

(1953=100)

Country	1954	1954 First half	1955 First half
Algeria	99	98	111
Belgian Congo	106	105	107
Morocco, French	108	109	115
Rhodesia and Nyasaland	104	100	85
Tunisia	103	100	134

INCREASED PRODUCTION

The table above shows that Africa's share in the production of most minerals increased in 1954. The net increase in world output of diamonds and phosphate rock was entirely due to the expansion of African production; Africa was also responsible for 98 per cent and 96 per cent, respectively, of the increase in world output of antimony and gold. Increases in world production of asbestos, cobalt, copper and lead were mainly accounted for by the expansion of African production. Moreover, except in the case of cobalt, the rate of increase in African production in 1954 was higher than that for the world as a whole. In the case of coal, African output increased as world production fell.

Among those minerals for which world production declined, the rate of decline in African production was less than that of world production in the case of chrome ore, iron ore and zinc, but greater in the case of silver and tin —and also of manganese, in respect of which almost half the decline in world production was attributable to Africa.

THE LIMITING FACTORS

Despite recent advances, there have been several limiting factors which affected production in varying degrees in different areas; any further marked expansion of output will depend on resolving these difficulties. Chief among these are rising costs, labour shortage and unrest, and inadequate transport facilities.

There was little expansion in known energy resources during 1954 and 1955. Coal production increased by about 2 per cent in 1954 and output of electrical energy, in the aggregate, by about 11 per cent. The review states that wide possibilities exist for the utilization of nuclear power, especially for mining and irrigation purposes, in areas remote from sources of coal and hydro-electric power.

As in previous years, the emphasis in development plans generally was on the provision of basic facilities, particularly communications, with a tendency to pay greater attention to social services, particularly housing, and to research on resources.

Factors of Increasing World Steel Production

There is little indication of a relaxation of the persistant pressure for steel in the markets of the world. Some observers attach profound significance to the decision of the Council of Ministers of the European Coal and Steel Pool to reduce the Customs duty on steel *imported* into Germany, writes our Iron and Steel Correspondent.

The industrial revival of Western Germany has become positively sensational, and the impressive expansion of steel production in the Federal Republic is merely keeping in step with the progress of all the great metal-using industries. In the first half of the current year crude steel production totalled 11,300,000 tons which was 9.8 per cent on excess of the output in the first half of last year, and since the end of that period the expansion has continued as such a rate as to impair confident forecasts that steel output will soon be running at the rate of 2,000,000 tons a month.

Admittedly Western Europe is encountering bottle-necks in the successive stages of steel production. Coke supplies are insufficient for the planned coke oven capacity. Shortage of coke limits the expansion of pig iron production and there is not enough pig iron for the projected increase in steel-making capacity.

NO SHORTAGE OF IRON ORE

Iron ore is is said to be the only material of which no shortage is threatened. Provision of the enormously increased tonnages of ore required to nourish the insatiable appetite of the steel plants in both hemispheres, can never be assured by hasty improvizations. Long term planning is essential, and although current needs are amply covered there can be no pause in the development of plans for the further exploitation of existing sources of supply and the tapping of new ore fields.

Exports of Swedish ore, especially rich in Fe content, are expected to reach 17,000,000 tonnes this year which represents an increase of 1,300,000 tons over last year, and further big developments are on the way.

Deliveries from the Canadian mines during the first six months of this year totalled 6,354,227 tons which represents an increase of 55 per cent as compared with the corresponding period of 1955 and a still more rapid rate of progress is foreshadowed in the near future.

ROLE OF THE ORE CARRIER

The extraction of increased tonnages of iron ore, however, is the last—not the first—problem of those engaged in this industry. Accessibility is the all-important consideration. The provision of rail transport facilities from the mines to the sea board, the construction of port facilities, and the arrangement of sea transport on an adequate scale constitute a series of problems which must all be solved before the regular flow of ore from the mine fields to the blast furnaces is assured.

Thus the Swedish ore producers, following the example of the British steel industry, have placed orders for a new fleet of ore carriers which will raise capacity from 300,000 to 500,000 tons per annum. The new vessels will be faster and of bigger size than any in the existing fleet. None of the ships ordered will have a capacity of less than 14,000 tons, there will be two of 21,000 tons, one of 27,000 tons and two 32,000 tonners. Five of them are designed to carry oil as an alternative cargo, but the principal purpose of these dual-purpose ships is to transport ore to European and American ports.

THE INDIAN SITUATION

Enumeration of these difficulties and the preparations to meet them throws into sharper perspective the immense problems confronting the Indian Government and the Indian steel industries in the attainment of a greater measure of self-sufficiency in the provision of the immense quantities of steel required for the development of agricultural and industrial resources.

The case for expansion needs no elaboration. At present the total yearly production of crude steel is rather less than 1,750,000 tons. Indian steeel is cheap. Compared with British steel there is a difference of about £10 per ton in favour of India, but supplies of course, are ludicrously inadequate.

A Government-sponsored scheme is in hand to raise production to 3,000,000 tons immediately, and a second five-year plan has been approved to further increase crude steel capacity to 6,000,000 tons and rolled steel capacity to 4,500,000 tons by 1961.

Whether these plans are within the compass of practical attainment is another matter. Even the responsible ministers and officials of the Government no longer conceal their doubts and misgivings.

They, too, have begun to realize that even if the plants are erected by the indicated dates—and this, to say the least, is doubtful—there are many other obstacles which may not be overcome.

To provide the extra 8,000,000 tons of ore required the capacity of existing mines will have to be expanded and mechanized and new mines opened up. If the present users of Indian coking coal are not to be deprived, an additional quantity of about 10,000,000 tons a year will be needed to feed the blast furnaces. Limestone requirements amounting to nearly 4,000,000 tons will have to be met from still undiscovered sources and it is questioned whether the developments of electric power can keep pace.

PROBLEMS OF TRANSPORT

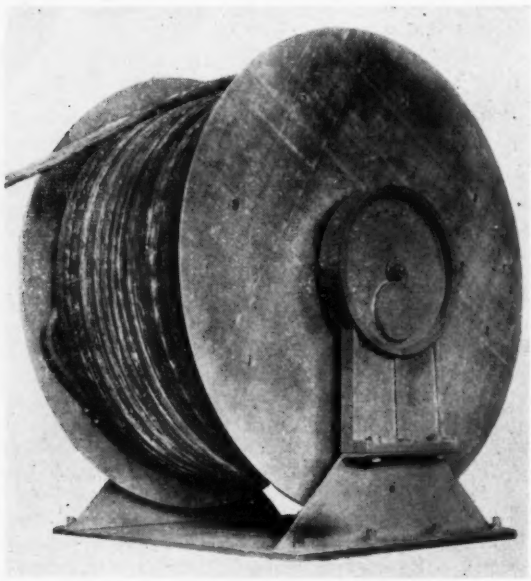
But above all else towers the problem of transport. Under the second five-year plan Indian freight conveying capacity, which is admittedly inadequate to meet the country's present needs, must be increased by 42,000,000 tons per annum. Special railway lines will have to be laid not only for the assembly of raw materials but also for the distribution of finished products. Wagon building will have to be undertaken on an extensive scale, and unless dock and railway handling facilities can be immensely improved both the completion and successful operation of the users may be subject to serious delays.

India's efforts to emerge from the stagnation of centuries and to achieve the status of a rising power will be watched with interest and with sympathy. But industrial growth and commercial success are not to be achieved over-night and it may well be that several decades will elapse before India's steel requirements do not exceed India's productive capacity.

MACHINERY AND EQUIPMENT

Self-Winding Electric Cable Reels for Mines

Among the many interesting applications of the range of Wayne patent self-winding electric cable reels are the Goliath and Mammoth. Both these reels are designed to handle the larger diameter cable necessary for general heavy industrial, and by inference, mining use.



The Wayne Mammoth electric cable reel

The Goliath is particularly useful for conveyors, magnets, etc., and is adapted to handle long lengths of medium heavy flexible cable of from ¾ in. to 1½ in. dia. and approximately 100 ft. long being fitted with a powerful spring mechanism. The principle employed is similar to that of the ordinary domestic spring roller blind, the cable being pulled out as required against the action of a spring which ensures that it is kept taut and when released, winds smoothly back again.

This results in a great improvement in the working of the cable, including reduced wear and tear and maintenance costs. as from the use of this reel it is stated to be possible to add at least six times to the working life of the rubber due to protection from accidental mechanical damage.

The Mammoth is designed to carry the very heavy trailing cable of up to 2½in. to 3 in. diameter and is specially adapted for heavy outdoor duty work and for excavating, loading and tunnelling. In some cases, because of the great weight of the cable, the cable may alternatively be carried out by hand operation wind or external chain drive instead of a spring. Care has been taken to ensure that the electrical contact gear is given adequate protection against the weather and the bad operating conditions found in quarry and mine working where dust in the atmosphere would be liable to interfere with efficient working.

These reels are manufactured by Power House Components Ltd., and carry the registered trade mark P.H.C.

P.V.C. Fans for Fume Removal

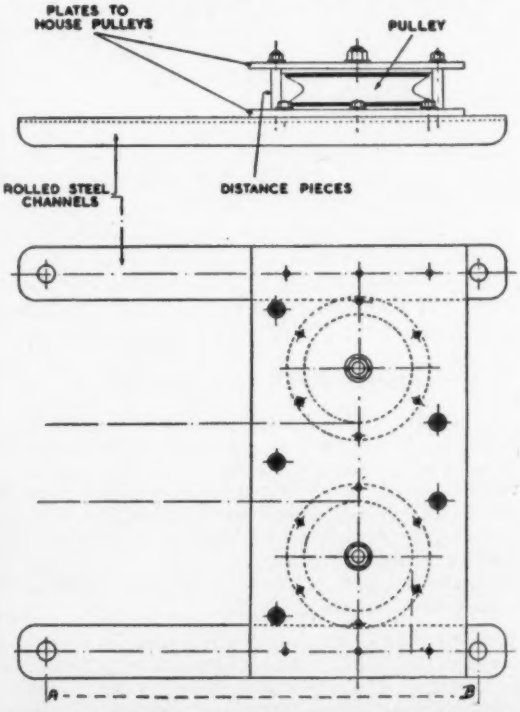
The Series 1 and 2 P.V.C. fans for fume removal are described in an interesting brochure by the manufacturers, Keith Blackman Ltd. Series 1 comprises a direct motor-driven range, and Series 2 an indirect pulley driven range. Series 1 fans will shortly be in production and will cover duties of 50 c.f.m. to 2,500 c.f.m. up to 4 in. w.g. pressure, while the Series 2 units—now available—are designed for handling from 2,000 c.f.m. to 40,000 c.f.m. and also for pressures up to 4 in. w.g. The Series 1 fan casing and impellers—the latter ranging through 6 in., 12 in. and 18 in. respectively in the three sizes—are moulded from light grey solid P.V.C. material, excluding steel centre hub and shaft. The Series 2 fan impeller is a multivane centrifugal type of virtually the same design as the Keith impeller.

Pulley Frames for Scraper Bucket Packing

Refinements to the haulage layout of scraper bucket packing systems which use the Thompson Dirt Bucket have been successfully developed in the Northern Division N.C.B. at Maude and Eccles Collieries. They are concerned with methods of anchoring the angling wheels for the bucket haulage ropes, especially at longwall face gate road heads. The conception is to provide a firm but easily movable anchorage for the pulleys to replace the customary system of fixing sheave blocks to temporary stay props wedged between floor and roof.

Two variations of the idea have been developed. One is used where no face conveyor gearheads are present, and consists of a pulley frame centred in the tail gate or main gate of single or double unit faces, and dowelled securely to the floor. The frame is a simple structure of steel channel and plate, a single unit which accommodates the deflector pulleys for both the main and tail haulage ropes. The frame is so dimensioned (in relation to the depth of the undercut of the face) and the dowel holes so placed in the frame that with each advance of the face the two leading dowel holes become the two rear dowel holes. This keeps to a minimum the number of holes to be drilled in the floor. The second variation, developed particularly for staggered double unit faces, uses the sledge framework of the face conveyor gearheads as a housing for the deflector pulleys.

Both methods have been used successfully. The first method has resulted in a saving of two man hours for each movement of the face forward; the second method has saved a total of four man hours for each forward movement.



Pulley frame for bucket packing (as described for first method). The dimension A-B should be the same as the depth of undercut

MINING MISCELLANY

A promising deposit of uranium has been discovered in France in the Departmente of the Haute Vienne, not far from the Limoges. This is in the vicinity of Crouzille, where a uranium deposit is already being exploited.

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The British-owned Indian Aluminium Co. Ltd. has signed an agreement providing for peace in the industry for five years. Under this pact the workers promise not to strike during the period and the management not to lock workers out. All differences will be settled by joint consultation.

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Workers of the Czestochowa Mine Construction Enterprise have completed the first stage of sinking the main and auxiliary shafts of Poland's new iron ore mine Zarki. This is the first mine in the new district of Myszkow, Stalinogrod voivodship, to be sunk this year, and is of medium size.

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Dr. Aziz Sidky, Egypt's Minister of Industry, has decided to set up several permanent mineral research centres in various parts of the Egyptian deserts. These centres will serve as headquarters for engineers and geologists engaged in exploration and prospecting or surveying desert areas from the air. Technical missions will very shortly be surveying the eastern desert and the Sinai peninsula.

* * *

Moscow Radio has announced the discovery of new and thick layers of coal by Soviet geologists near the Kushmurun station on the South Siberian railway in Kazakhstan. The layers of coal, 15-20 metres thick, occupy the greater part of the Ubogan Valley. The Ural Institute of Mining is now drafting plans to build open cast mines and a mining town to be known as Ubogan.

* * *

The Spanish Ministry has authorized a 40 per cent participation by the Lithium Corporation of America, Inc., in a new Spanish company to be founded jointly with Spanish Titania S.A. The new undertaking will develop lithium ore resources of Titania S.A. at Lalin, near Pontevedra. Under Spanish law, foreign capital participation in industrial undertakings is normally limited to 25 per cent. Larger participation is possible in special cases, however, on application to the Ministry.

* * *

A new company known as La Société des Charbons de Lukuga has been formed to work the coal deposits of the Lukuga basin near Lake Tanganyika, in the Belgian Congo. The project involves the production of at least 1,250,000 tons of coal annually and its treatment near the pithead for an annual output of 80,000 tons of motor spirit, 30,000 tons of diesel oil, and smaller quantities of paraffin and lubricants. The new company has a capital of frs. 42,000,000. It is understood that the chief shareholders include Union Chimique Belge and Géomines and that the capital eventually needed will be in the region of frs. 2,000,000,000 or £15,000,000.

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"Aluminium for Transmission Lines" is the title of a new handbook published by Aluminium Union Ltd., of London. This publication, which was prepared in collaboration with Aluminium Laboratories Ltd., of Ontario, Canada, describes the method of selection and installation of bare aluminium stranded conductors and A.C.S.R. for transmission and distributionlines. Specifically designed to serve as a quick reference book for engineers and designers, it should also be of value to students approaching transmission line problems for the first time. Copies may be obtained by application to the nearest sales office of the Aluminium Ltd. group.

* * *

India's Planning Commission has accorded a high priority to a lignite project in the South Arcot District of Madras State, which envisages the mining of 3,500,000 tons of lignite per year, as well as the production of 70,000 tons of urea and sulphate nitrate and 380,000 tons of carbonized briquettes. The total cost is expected to be in the region of Rs.52 crores. Machinery and equipment have already been ordered, among them being excavators and spreaders worth Dm.18,000,000 or over two crores of rupees, which are being purchased fom L.M.G., of Lubeck, West Germany.

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The U.S. Department of Agriculture has released the first public information on barter deals for strategic materials for the supplemental stock pile, reporting that in July (the first month of the fiscal year of 1957) its transactions amounted to $15,300.000. This compares with $28,300,000 in July, 1955, and with $104,900,000 for the entire fiscal year of 1956. Of the materials contracted for in July, 1956, beryllium-copper accounted for $9,900,000, manganese ore for $3,400,000, and mica and cadmium for $1,200,000 and $800,000 respectively. The $104,900,000 for the contract total for the fiscal year 1956 included $46,100,000 for ferro-manganese, $26,200,000 for industrial diamonds, and $11,800,000 for fluorspar.

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Detailed costs of producing nearly 250 s.tons of titanium sponge metal in a Government pilot plant at Boulder City, Nev., are given in a Bureau of Mines report. The information, accumulated during 15 months of continuous operation of the pilot plant (which ceased operations in 1954) could be used by existing commercial producers for comparative purposes and by potential producers as a basis for cost calculations. A copy of the report (Report of Investigations 5248, "Titanium Plant at Boulder City, Nev.: Operating Costs") can be obtained from the Bureau of Mines, Publications-Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

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Australia's mining output should be twice its present level in another five to 10 years, according to a leading Swedish mines expert, Mr. Ivar Thomaeus, manager of the Drillco Division of the Atlas Copco group. Following an inspection of the country's main mining centres, he said that Australia had only just started to "scratch the surface" for mineral resources. Her annual production of ore and concentrates of less than 4,000,000 tons compared with 22,500,000 tons in Scandinavia, yet the mineral potential in Australia far surpassed that of Scandinavia. He added that a large amount of risk capital, put up locally or from overseas, would be needed to develop Australia's mining industry as quickly as it should be developed. His company was considering the establishment of a factory in Australia to manufacture light drilling equipment for local and export markets.

* * *

Mr. J. B. Goad, president of Explorers Alliance Ltd., has announced that an immediate start will be made on exploration of a copper concession granted by the Eire Government. The concession covers some 15 sq. miles in County Waterford and is the site of former copper-producing veins. In order to get exploration under way the company has financed an Irish subsidiary to the extent of $100,000. The company has also been granted three further concessions: to explore and develop "an extensive property" in the Kenmare area of County Kerry where copper and lead mineralization had in the past been found and mined; to explore and develop an area in the West Carberry copper district of County Cork; and to explore, develop and prospect in the East Clare Section of County Clare, which the company's geologists think might be developed into a lead-zinc field. These properties are in addition to the company's previously announced holdings in Eire.

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Can-Erin Mines Ltd., operating an abandoned copper property in Eire state that early results of the diamond-drilling programme are "much more promising than anticipated." Hole No. 1 at the Mountain Mine on the company's 200 square-mile Allihies concession in West County Cork has already intersected six new mineralized zones, any of which could lead to entirely new structures. The best intersection was 4.4 ft. averaging 2.63 per cent copper, which included a section of 1.2 ft. with an average grade of 10.2 per cent copper. The No. 1 hole is one of three deep holes being put down from the surface at the Mountain Mine, one of several of the Bearhaven group of mines on the Allihies concession. This mine, which has a 1,800 ft. shaft now being dewatered, produced 27,000 tons of copper during the last century from 300,000 tons of ore. Investigation by the Geological Survey of Ireland has indicated that the sedimentary horizon, which provides favourable host rock for the vein systems of the Bearhaven group is 15,000 to 20,000 ft. thick, giving unlimited depth possibilities to mining operations. Initial work to date has indicated copper mineralization to be much more widespread throughout the concession than had been expected.

* * *

Since the publication, in 1931, of the Geological Survey Memoir "Chemical Analyses of Igneous Rocks, Metamorphic Rocks and Minerals,' several hundred complete and partial analyses have been made in the Chemical Laboratory of the Geological Survey of Great Britain. During much of this period, the conditions brought about by the second world war prevented the annual compilation of annalyses in the "Summary of Progress" and delayed publication of memoirs. The results, published and unpublished, of analyses carried out under the auspices of the Geological Survey have accordingly been published by the Geological Survey in a single volume entitled "Chemical Analyses of Igneous Rocks Metamorphic

Rocks and Minerals, 1931-1954," which is obtainable from Her Majesty's Stationery Office.

* * *

We have received from Consolidated Pneumatic Tool Co. Ltd. a trade catalogue printed as an airmail edition. This 24-page publication is fully illustrated and covers the entire range of the company's pneumatic power tools and compressors, with complete specifications. We understand that this is the first airmail edition of a comprehensive trade catalogue in the field of compressed air equipment. The weight is under one ounce, including the envelope. Apart from the considerable saving on airmail postage, the catalogue has a distinct novelty value which, as the company states, will at least indicate to overseas buyers a desire to deal with their enquiries promptly.

PERSONAL

Mr. C. B. Anderson has been appointed a director of the Union Steel Corporation (of South Africa) in place of Mr. S. Spiro, who has resigned from the board.

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Mr. D. O. Beckingham has been appointed a director of the Anglo American Corporation of South Africa.

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Mr. H. C. Koch has resigned from the board of St. Helena Gold Mines. Mr. S. Spiro has joined the Board.

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Mr. P. A. Revell-Smith has been appointed a director of the Mountain Copper Company.

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The board of the North Charterland Exploration Co. (1937) comprises Major-General J. D. Shapland (chairman), Major-General Sir Peter Bednall, Mr. C. B. White and Mr. J. H. Mitchell.

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Lord Reith has been appointed a director of the British Oxygen Company.

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Mr. W. J. McBrian, of Peoria, Illinois, vice-president of Caterpillar Tractor Co., has been appointed chairman of the company's British subsidiary, Caterpillar Tractor Co. Ltd., with effect fom November 1. He will continue to hold office as a vice-president of the U.S. company. Mr. W. J. Bornholdt, managing director of the subsidiary since its organization in 1950, will return to the U.S. at the end of this year. At that time, Mr. McBrian will also become managing director of the subsidiary and its operating headquarters will be transferred from Desford, Leicester, to Glasgow.

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Mr. E. W. Lean has resigned from the chairmanship of Associated Clay Industries, but remains a director. Mr. Philip Sellars, the managing director, has been appointed chairman of the company.

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The Stanley Elmore Research Fellowship in Extraction Metallurgy has been awarded to Dr. N. E. Richards, of New Zealand. He will shortly take up the Fellowship, working with the Nuffield Research Group in Extraction Metallurgy at the Imperial College of Science and Technology, London.

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Thirty-four papers on a wide variety of subjects will be presented during the 29 sessions of the Public Works and Municipal Services Congress to be held at Olympia, Lodon, from November 12 to 16. The exhibition, which is run in conjunction with the congress will continue until Saturday, November 17.

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A Safety Campaign is to be held in the West Midlands Division of the National Coal Board. It will be opened on September 20 with a meeting at the Wulfrun Hall, Wolverhampton. Representatives of all the collieries, including management and men, will be present at the meeting, at which speakers will deal with various aspects of the safety question.

* * *

An international conference on mine safety will meet in Luxemburg on September 24, the Council of Ministers of the European Coal and Steel Pool has decided. It will consist mainly of representatives of the six member nations, but participation by the International Labour Office will be requested and the High Authority has been directed to ask that a British delegation be sent. A directive calls on the conference to make plans for a permanent body, over which the High Authority will preside, to ensure that safety precautions are kept up to date.

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Speakers from all sections of industry will be represented at a conference organized by the Incorporated Sales Managers' Association in collaboration with the British Institute of Management, which will take place on Tuesday, October 9, at the Royal Festival Hall, London. The subject for discussion is "Can We Sell Our Way Out of Inflation?" Among the speakers are Mr. John C. George, C.B.E., M.P., chairman of Scottish Slate Industries and of Joy-Sullivan Ltd., and Mr. Montague Pritchard, M.C., deputy managing director of F. Perkins Ltd.

* * *

Nearly 200 metal experts from 27 nations plan to attend the Second World Metallurgical Congress to be held next year in Chicago, Illinois, as indicated by a large and impressive early registration list. Conferees will arrive in the U.S. by mid-October, 1957, for a two-week tour of the metal working industry before convening in Chicago for the congress, which will take place from November 2-8. It is being held in conjunction with the National Metal Exposition and Congress, which is the largest industrial metal exhibition in the U.S.

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The sixth International Meeting of S. G. Iron Licensees, convened by the Mond Nickel Co. Ltd., in conjunction with Metallgesellschaft A.G., was held in Essen from August 29 to 31. There was a record attendance of over 270 from 19 countries. Particular interest was shown in a new nickel-free calcium-silicon-magnesium-iron pre-alloy, known as M.G. 55 alloy, for the production of spheroidal graphite in cast iron.

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The following dates of forthcoming annual general meetings have been announced: Institution of Mining Engineers, January 31, 1957; Manchester Geological and Mining Society, October 11, 1956; The Midland Counties Institution of Engineers, October 3; the Midland Institute of Mining Engineers, October 4; the North Staffordshire Institute of Mining Engineers, October 1; the South Staffordshire and Warwickshire Institute of Mining Engineers, October 17; and the South Wales Institute of Engineers, October 11.

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On Monday, September 3, for the first time for several years, the Kingsway and Oxford book shops of Her Majesty's Stationery Office began the sale of U.S. Government publications from stock. Certain U.S. official publications will also be available at H.M.S.O. book shops in Bristol, Birmingham, Cardiff, Manchester and Edinburgh.

CONTRACTS AND TENDERS

The International Co-operation Administration (I.C.A.) has announced the following future authorizations:

Spain	*Contract Period*	*Terminal Delivery Date*	*Amount (in U.S. dollars)*
Construction, mining and conveying equipment; motor vehicles, engines and parts; including ocean transportation, (PIO/C No. 52-22-141-6-60049)	15/6/56-31/12/36	31/12/57	1,845,500
Coal firing equipment (including construction, mining and conveying equipment, value $350,000) (PIO/C No. 52-22-05-60158)	1/8/56-31/1/57	31/12/57	436,000

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A number of orders have been received recently by Metropolitan-Vickers Electrical Co. Ltd. for large electric winders for coal and gold mines in South Africa, where M-V winders have for many years been in a large majority. For instance, a 4,300-h.p. automatic a.c. geared equipment for the General Mining and Finance Corporation will drive a tower-mounted four-rope friction winder and incorporates a new system of control. Winding will be carried out continuously under completely automatic control, utilizing grid-type rotor resistances and closed loop dynamic braking with d.c. supply from a mercury arc rectifier. Automatic operation will the initiated by skip loading arrangements. The winding depth is 5,000 ft. and the normal loads 15 s.tons of ore in balanced skips. This is the largest friction drum winder so far developed by any maker. Two 6,700-h.p. r.m.. (14,200-h.p. peak) Ward-Leonard double-drum winders ordered recently by New Consolidated Gold fields Ltd. will be the largest in South Africa. They will be largest winders in the world having completely automatic closed loop control, and will be the first automatic winders in South Africa to employ the laminated exciter system—the company's latest closed loop development. New Consolidated has also ordered four 5,200-h.p. a.c. winders with dynamic braking. One equipment will be winding in the same shaft as the Ward-Leonard equipments mentioned above. Thus there will be installed in one shaft three Metropolitan-Vickers winders aggregating 18,600 h.p.—more than that of any other mine shaft in the world.

METALS, MINERALS AND ALLOYS

COPPER.—The worsening of the Suez situation and the widespread labour unrest on the Copperbelt are keeping non-ferrous metal markets firm—firmer, perhaps, than they would be if these two influences were not dominating the market. Indeed, with the exception of tin, demand is only reasonably good and markets are just ticking over.

In copper, factors of this kind would normally be expected to hoist the price considerably. That the quotation has been no more than steady indicates that either buyers are adopting a "wait and see" attitude or, even, that the need to come into the market is simply not there.

The U.S. copper market is quiet and featureless although the undertone is firm. The news that the United Steel Workers' Union and the Kennecott Copper Corporation have now negotiated a new 35 month wage agreement covering workers at the company's Garfield Copper Refinery made no impact on the market one way or the other. The pact is similar to the agreement reached between the Steel Workers' Union and the American Smelting and Refining Company and calls for a total outlay by the companies of 33¼ c. an hour over the length of the contract, which expires on July 31, 1959. Fringe benefits, including a new pension scheme effective from September 1, 1957, improved health and welfare benefits, and double time and a half for holiday work are also part of the agreement. Meanwhile, producers are quoting 40 c., custom smelters 39 c., and scrap is being offered at 32½ c. a lb.

Last Wednesday a state of emergency was declared in the Copperbelt followed by the taking into custody of 32 Africans, both the key officials of the African Mineworkers' Union (including Mr. Nkoloma, the general secretary, who has been the prime mover in the recent strikes) and some prominent members of African Congress

There can be no doubt that the Northern Rhodesian government must have taken this step with the greatest reluctance as it serves only too clearly to underline the failure of the A.M.U. officials to measure up to the responsibilities which devolve on union leaders under the advanced form of industrial organization towards which the African on the Copperbelt is being encouraged to aspire.

Mining Journal readers will recall that in our issue of March 9 (p. 235) we gave a detailed appraisal of the current state of the A.M.U. and of its relations with the Chamber of Mines. In essence, the situation has developed since then in two directions. On the one hand, active union opposition has developed to the transfer of certain of its members to the Staff Association as the result of the implementation of "African advancement". This has resulted in precipitating strike action (either disguised or overt) without reference to the established machinery for negotiation, also in intimidation of Africans wishing to take advantage of advancement opportunities.

Secondly, Mr. Nkoloma has refused in any way to co-operate with the Commission of Inquiry set up by the Northern Rhodesian government to investigate the state of unrest created by the irregular strike action of recent months. There is, thus, reason to suppose that the union is reluctant to facilitate too close a scrutiny of its internal affairs.

This week's announcement of a state of emergency forcibly indicates that both the Chamber and the government are at an impasse in their dealings with the present union leadership. They have now taken the drastic step of removing the more obvious troublemakers while indicating that they will make every effort to preserve the facilities for negotiation through the existing union. It remains to be seen whether fresh and more responsible union leaders will emerge under Mr. Katilungu, the union's president, who has been out of the country during the recent agitations and is generally regarded as representing the more moderate elements in the A.M.U.

LEAD AND ZINC.—Lead and zinc are good markets both here and in the United States where battery manufacturers continue to absorb sizeable quantities of lead. In zinc, supplies of Prime Western are being absorbed by the galvanizing trade as steel production moves towards peak production levels. Demand for special high grade is improving but is below expectations. Diecasters are expected to expand their purchases towards the end of this month when all the new automobile models will be on public display.

TIN.—Tin is a strong market in the East, in London, and in New York. The price is directly affected—and rightly—by developments at the Suez and with the worsening of the canal crisis the quotation in London is well over the £800 a ton level. So long as the possibility remains of the canal being closed, demand will remain good, although a large proportion of this will rank as scare buying. New York, taking its lead from London, is also experiencing improved activity with buying of spot supplies a feature. On Tuesday, the U.S. spot price closed at $1.04½ per lb. One repercussion of the recent U.S. steel strike has now made itself felt. The U.S. Steel Corporation has announced a 10 c. per lb. increase in the base box price of tinplate effective from November 1 next. Other producers are expected to follow suit.

ALUMINIUM.—Kaiser has signed a three-year no-strike agreement with the A.F.L.-C.I.O. United Steelworkers and averted a strike of 8,000 employees at the company's plants in Washington, Ohio and Maryland. The agreement is similar to contracts previously negotiated by Reynolds and Alcoa and is generally regarded as closing the door to any serious labour troubles within the U.S. primary aluminium industry for a long period.

Kaiser estimates that the U.S. will double its use of aluminium in the next nine years. According to its vice-president and treasurer, Mr. Donald Browne, the company expects the U.S. to consume more than 4,000,000 s.tons of aluminium a year by 1965. The shortage is likely to continue through 1957, with a slight surplus in 1958 and a shortage re-appearing in 1959. Kaiser's current $178,000,000 expansion programme is designed to increase annual primary capacity from 433,500 tons of aluminium metal to 587,000 tons by 1958. The company will then be producing four times as much metal as it did in 1950 and more than four times as much as the U.S. produced before the last world war.

Reynolds has announced that it is acquiring 1,500 acres of land near Massena, N.Y., for a proposed aluminium reduction plant. According to the New York State Power Authority this plant, which would use St. Lawrence power under a proposed contract, would cost $100,000,000. Public hearings on the proposed power contract, under which Reynolds would buy up to 239,000 kW, will be held in New York City on October 10.

West Germany's aluminium imports last year were more than double the 1954 volume and will probably have doubled again by 1960. Last year's higher imports were necessitated by a jump of nearly 25 per cent in domestic demand, from 229,000 tonnes in 1954 to 284,000 tonnes in 1955. Production was unable to keep pace with this rapid increase, though it rose by 16 per cent from just below 200,000 tonnes in 1954 to 232,000 tonnes in 1955. The expected further increase in imports to an estimated 80,000 tonnes by 1960, compared with 21,000 tonnes in 1954, will result from what has been described as the rather hesitant attitude of West German aluminium producers. This attitude is said to be due in part to doubts as to whether domestic demand will continue to increase at the present rate and partly to the fact that investments in new West German aluminium capacity offer a fairly small profit margin, due to the current high interest rate on bank loans and to the absence of low-cost electricity.

The impact of copper and brass production on the aluminium industry will be examined at the annual convention of the National Association of Aluminium Distributors, which will be held at White Sulphur Springs, W. Va., on October 24-28. There will also be discussions on such subjects as how to sell effectively and the progress of the packaging industry.

A report from the U.S. states that a highly wear-resistant coating of sprayed steel on aluminium cylinder walls has opened new horizons to designers of engines and has removed a major obstacle to the development of all-aluminium engines for motor vehicles.

COLUMBIUM.—Fansteel Metallurgical Corporation is to build a $6,500,000 plant in Muskogee, Oklahoma, U.S., to produce tantalum and columbium. The new plant will increase the firm's tantalum capacity by 50 per cent and its columbium capacity by 150 per cent. Tantalum metal is used in the manufacture of capacitors for telephone equipment, electronic devices and guided missiles. Columbium has been used in experimental thermal nuclear reactors. Fansteel's large extension project is an indication of U.S. confidence in the potential markets which exist for both metals—doubtless on both sides of the Atlantic.

NICKEL.—The U.S. Bureau of Foreign Commerce has removed export restrictions on nickel-alloy copper scrap to friendly nations, provided the scrap will be converted to nickel metal and returned to the U.S. All other exports of nickel-bearing scrap, including nickel-copper alloy scrap for consump-

tion abroad, remain under the total embargo announced by the Bureau on June 21, 1956. The export relaxation has been made only because of heavy U.S. demand for nickel metal and because nickel copper alloy scrap is not being processed domestically to recover nickel metal on a commercial scale.

PLATINUM.—The U.S. platinum market remains very steady with offers from Europe still on a limited scale, and it is believed that 1956 may well set a record for total consumption. Dealers on the outside market have noted less pressure, however, and, in fact, have found some selling competition necessary to move supplies. All sellers maintained the rate of $103-$105 per oz. From Colombia it is reported that proceeds from the sale of platinum are now permitted to be sold to the free market, which will add more than $1,000,000 to the currency market.

QUICKSILVER.—Imports of quicksilver into the U.K. during July reached the exceptionally heavy total of about 8,390 flasks, the bulk of which was reported to be from Italy. This total dwarfs the average monthly rate of approximately 1,000 flasks imported during 1955 and is understood to be equivalent to about seven months' domestic requirements at the present rate of annual consumption. It is believed that some of this quicksilver might have been imported in anticipation of industrial requirements. The Board of Trade has announced that it has no plans at the present time for further commercial sales of quicksilver from the government's stockpile. Earlier this year approximately 1,000 flasks were released to the trade and some were exported to the U.S. Trading interest in quicksilver in the U.K. remains at a low ebb and the market is not expected to harden materially, since available supplies in London are reported to be ample.

In connection with the present depressed condition of the market, it is interesting to note that in the first six months of 1956, Italy exported 1,088 tons of quicksilver compared with 481 tons in the corresponding period of last year.

The second 80-ton unit of the Palawan Quicksilver Mine's reduction plant in Palawan (south-western Philippines) has started operations on a production basis and is reported to have been working satisfactorily.

TITANIUM.—Titanium is assured of a prominent role in the world of metals, but like all other metals it has its limitations. Such is the conclusion of a survey conducted by Armour Research Foundation of Illinois Institute of Technology for the Titanium Metallurgical Laboratory, Columbus, Ohio, to determine the applicability of titanium in gas turbines for use in aircraft. Titanium alloys, which, on the whole, are strong and relatively light, cannot withstand as much heat as certain other metals. The use of titanium in aircraft engines may, therefore, be limited to parts towards the front end of the compressor, where temperatures are within the limits of this metal. Experience to date indicates that weight reduction can be achieved on parts operating at temperatures up to 750 deg. F. New titanium alloys now under development are promising and may increase the maximum permissible operating temperature of titanium parts to approximately 1,100 deg. F., but, according to available knowledge, there is little likelihood that titanium base alloys can be developed for use above 1,200 deg. F. with strength-density ratios superior to other materials now known. Other types of airborne power plants—such as ramjets, pulse jets, turbofans, rockets or nuclear power plants —could have a decided effect on future titanium requirements.

TUNGSTEN.—The U.S. General Services Administration (GSA) has announced that it will soon offer to buy 1,250,000 s.tons of tungsten concentrates produced from domestic ores. These purchases will be the first to be made of four strategic materials under the appropriation of $21,000,000 voted by the recently-adjourned Congress. The buying programme is intended to cushion the loss of markets suffered by producers when the Federal Government stopped buying U.S.-produced tungsten, asbestos, fluorspar and columbium-tantalum for the national stockpile.

The London Metal Market

(From Our Metal Exchange Correspondent)

As was to be expected, operations on the Exchange have been at a minimum owing to the Suez developments and the recall of Parliament on Wednesday. The basic weakness of the copper market has been underlined by the fact that prices have not risen in spite of politics and labour unrest in Rhodesia, either of which would have caused an appreciable price rise had any demand developed. Consumer off-take in Europe remains below normal whilst that in America can only be classed as normal, and with the general labour situation now looking brighter a sharp drop in price is generally expected if there are no violent political happenings.

Tin has been the metal most affected by the Middle Eastern situation and with consumer demand remaining good, an appreciable rise in the price has taken place and it is difficult to see how any major reaction can set in so long as there is the slightest possibility of shipments being interrupted. On Thursday morning the Eastern price was equivalent to £825½ per ton c.i.f. Europe.

Demand for both lead and zinc remains good in Europe as well as in America and this has contributed to the generally firm undertone of the two markets. The increase in the backwardation in the lead market appears to be due rather to shortage of supply than to any sudden demand for the metal and it is hoped that the situation will become more normal again by the end of October.

Closing prices and turnovers are given in the following table :—

	September 6		September 13	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Copper				
Cash	£307½	£308	£309	£309½
Three months	£307	£307½	£308½	£309
Settlement	£308		£309½	
Week's turnover	3,250 tons		4,175 tons	
Tin				
Cash	£772	£773	£807	£808
Three months	£768	£768½	£799	£800
Settlement	£773		£808	
Week's turnover	875 tons		1,260 tons	
Lead				
Current half month	£116½	£117	£118½	£119
Three months	£115	£115½	£116½	£116½
Week's turnover	2,025 tons		2,850 tons	
Zinc				
Current half month	£95½	£96	£97	£97½
Three months	£94	£94½	£94½	£95
Week's turnover	2,525 tons		3,675 tons	

OTHER LONDON PRICES — SEPTEMBER 13

METALS

Aluminium, 99.5%, £198 10s. per ton
Antimony —
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.
Bismuth
(min. 1 ton lots) 16s. lb. nom.
Cadmium 12s. 0d. lb.
Chromium, 6s. 11d. lb.
Cobalt, 21s. lb.
Gold, 251s. 7½d.
Iridium, £29/31 oz.
Manganese Metal (96%-98%) £259/£265 according to quantity
Magnesium, 2s. 4d. lb.
Nickel, 99.5% (home trade) £519 per ton
Osmium, £24/27 oz. nom.
Osmiridium, nom.
Palladium, £8 0s./£8 10s. oz.
Platinum U.K. and Empire Refined £34/£35 oz. Imported £37 15s. nom.
Rhodium, £42.
Ruthenium, £15/£17 oz.
Quicksilver, £83 10s. ex-warehouse
Selenium, 112s. nom. per lb.
Silver, 78¾d. f.oz. spot and 78¾f'd.
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth	60% 8s. 3d. c.i.f. 30% 5s. 0d. lb. c.i.f.
Chrome Ore —	
Rhodesian Metallurgical (semifriable) 48%	£16 15s. 0d. per ton c.i.f.
,, Hard Lumpy (45%)	£16 15s. 0d.
,, Refractory 40%	£10 15s. 0d. per ton c.i.f.
,, Smalls 42%	£13 15s. 0d. per ton c.i.f.
Baluchistan	£17 5s. 0d. c.i.f.
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite, Raw (ground)	£21 0s./£22 0s. d/d
Molybdenite (85% basis)	8s. 2½d. nom. per lb. (f.o.b.)
Wolfram and Scheelite (65%)	244s. 0d./248s. 0d. c.i.f.
Tungsten Metal Powder (98% Min. W.)	20s. 0d. nom. per lb. (home)
Ferro-tungsten (80%-85%)	17s. 0d. nom. per lb. (home)
Carbide, 4-cwt. lots	£41 3s. 9d. d/d per ton
Ferro-manganese, home	£68 per ton
Manganese Ore Indian Europe (46%-48%) basis 125s. freight	105d./106d. nom. per unit c.i.f.
Manganese Ore (43%-45%)	98d./99d. nom. per unit c.i.f.
Manganese Ore (38%-40%)	92d. nom. per unit.
Brass Wire	3s. 1½d. per lb. basis
Brass Tubes, solid drawn	2s. 5½d. per lb. basis

COMPANY NEWS AND VIEWS

Mining Issues Maintain Firm Undertone

In the face of a drop from 509.49 on September 6 to 499.97 by September 12 in *The Dow Jones Industrial Index* and a decline from 183.1 to 181.2 in *The Financial Times Index*, London mining issues behaved extremely well during the past week. Although golds showed small losses almost throughout the list, there was little stock on offer and the technical position remained firm. Despite the adverse investment climate, coppers, diamonds, platinums and tins were all firm.

Due to the lack of follow through, Wall Street's attempted rally was short lived. Fears regarding Suez continued to play a large part in upsetting sentiment while generally encouraging business news and good fourth quarter forecasts were ignored.

U.K. investors were showing a distinct unwillingness to enter into commitments until international political uncertainties have resolved themselves. Apprehension was voiced regarding the outlook for sterling, particularly in view of the unions' unfavourable attitude towards wage restraint. In view of these factors, together with the wider trade gap for August, the steadiness of markets was creditable.

"Little" Rand Dividend Season

A feature of the week was higher dividends from three of Anglo America's new O.F.S. mines. Presidents Brand and Steyn will pay 2s. and 1s. respectively against 1s. 6d. and 9d. for March, while Western Holdings' distribution was up to 2s. from 1s. 6d. While the first two announcements were in line with what the market had been expecting, that for Western Holdings was better than anticipated.

Talking points on Kaffirs includes the possibility of investment hedging against the deteriorating U.K. economic position *vis-à-vis* sterling and hopes of a favourable outcome to the impending I.M.F. meeting at which the future price of gold will come under discussion.

Tata's 2,000,000 Ton Programme

In his statement to shareholders of the Tata Iron and Steel Company, the chairman, Mr. J. R. D. Tata, referred to the loan of $75,000,000 (or £27,000,000) which the company had negotiated with the World Bank, the agreement being signed on June 26, 1956. He said that this was the largest loan granted up to now by the Bank for an industrial undertaking anywhere in the world and also the largest single loan granted for any purpose to any country in Asia. This loan of $75,000,000 and the additional share capital of $28,000,000 (£10,000,000) authorized by shareholders towards the end of the previous year provide about $103,000,000 (£37,000,000) out of the total of $157,000,000 (£56,000,000) required for the further expansion known as the "Two Million Ton Programme". The balance will be secured from retained earnings over a period of five years ending 1960 and from further borrowings. Under the programme production of ingot steel is to be raised to 2,000,000 tons per annum within a period of three years. The contract for the engineering, procurement, construction and supervision services has been placed with two divisions of the Henry J. Kaiser Corporation, of California.

Kaffir Returns for August

Working profits of Rand, O.F.S. and Klerksdorp gold producers during August were based on the exceptionally high gold price of 251s. 3d. per oz. compared with only 249s. 10d. for July.

Good progress was made by Anglo American's young and expanding mines. At F.S. Geduld crushing increased by 2,000 tons and grade moved up to 8.3 dwts. per ton from 8.1 dwts. Profits improved to £70,600 from £64,936. President Brand also stepped up its throughput by 1,000 tons and profits rose to £377,002 from £369,147. Western Holdings milled 2,000 tons more than in July. Profits at £231,048 were better than the previous figure of £222,535. At Welkom, however, it was

LONDON STOCK EXCHANGE PRICES — SEPTEMBER 6 - SEPTEMBER 12, 1956

Finance	Price Sept. 12	+ or — on week
African & European	3 1/16	—1/16
Anglo American Corpn.	7 1/16	+1/16
Anglo-French	23/-	.....
Anglo-Transvaal Consol.	1 1/16	.....
Central Mining (£1 shrs.)	54/-	—3d
Consolidated G'fields	60/3	+9d
Consol. Mines Selection	1 1/4	—1/16
East Rand Consols	1/9	.....
General Mining	3 1/2	.....
H.E. Prop.	8/7 1/2	—1 1/2d
Johnnies	38/6	.....
Rand Mines	3 1/16	.....
Rand Selection	1 15/16	—1/16
Union Corporation	36/-	—9d
Vereeniging Estates	4 1/16	—1/16
Writs	1 1/16	—1/16
West Wits.	35/10 1/2	—10 1/2d
Rand Gold		
Blyvoors	22/1 1/2	+4 1/2d
Brakpan	6/3	—1 1/2d
Buffelsfontein	27/4 1/2	—3d
City Deep	10/9	—6d
Consol. Main Reef	13/9	—1 1/2d
Crown	1 1/16	—1/16
Daggas	2	—1/16
Dominion Reefs	18/3	.....
Doornfontein	20/9	—3d
Durban Deep	1 1/16	.....
E. Champs	3/-	.....
E. Daggas	9/4 1/2	.....
E. Geduld (4s. units)	28/3	+3d
E. Rand Props.	46/3	—1/3
Geduld	3 1/2	.....
Govt. Areas	3/10 1/2	—1 1/2d
Grootvlei	19/4 1/2	.....
Hartebeestfontein	39/10 1/2	+6d
Libanon	7/1 1/2	+1 1/2d
Luipards Vlei	13/-	.....
Marievale	20/10 1/2	—3d
New Kleinfontein	3/10 1/2	.....
New Pioneer	14/3	—3d
Randfontein	37/-	—1/3
Robinson Deep	8/9	—4 1/2d
Rose Deep	9/6	.....
Simmer & Jack	3/10 1/2	—1 1/2d
S.A. Lands	1 1/16	.....
Springs	2/6	.....
Stilfontein	24/1 1/2	—3d
Sub Nigel	1 1/16	—1/16
Vaal Reefs	30/1 1/2	—4 1/2d
Van Dyk	2/6	.....
Venterspost	13/10 1/2	+1 1/2d
Vlakfontein	16/7 1/2	—3d
Vogelstruisbult	15/4 1/2	—9d
West Driefontein	5 1/16	—1/16

Rand Gold contd.	Price Sept. 12	+ or — on week
W. Rand Consolidated	1 11/16	.....
Western Reefs	27/9	—6d
O.F.S. Gold		
Freddies	8/-	.....
Freddies Consolidated	4/-	.....
F.S. Geduld	4 1/2	—1/16
Geduldries	7/4 1/2	—1 1/2d
Harmony	26/3	—6d
Loraine	5/9	—1 1/2d
Lydenburg Estates	15/-	—7 1/2d
Merriespruit	7/4 1/2	—1 1/2d
Middle Wits	11/3	—3d
Ofsits	56/9	—9d
President Brand	2 1/2	.....
President Steyn	32/10 1/2	—4 1/2d
St. Helena	27/9	—6d
Virginia Ord.	9/7 1/2	.....
Welkom	18/4 1/2	—1 1/2d
Western Holdings	3 1/16	.....
West African Gold		
Amalgamated Banket	1/4 1/2	—1 1/2d
Ariston	3/10 1/2	—1 1/2d
Ashanti	15/-	—6d
Bibiani	2/-	—1 1/2d
Bremang	1/4 1/2	+1 1/2d
G.C. Main Reef	1/6	—1 1/2d
Konongo	1/6	—1 1/2d
Marlu	1 1/2d	.....
Taquah	2/1 1/2	+3d
Western Selection	7/9	—3d
Australian Gold		
Gold Mines of Kalgoorlie	13/10 1/2	+1 1/2d
Great Boulder Prop.	11/3	.....
Lake View & Star	16/3	—4 1/2d
Mount Morgan	19/3	—3d
North Kalgurli	7/3	+3d
Sons of Gwalia	2/7 1/2	—1 1/2d
Western Mining	11/-	+6d
Miscellaneous Gold		
Cam & Motor	7/6	.....
Champion Reef	6/4 1/2	.....
Falcon Mines	7/10 1/2	+1 1/2d
Globe & Phoenix	23/9	.....
Motapa	10 1/2d	.....
Mysore	3/4 1/2	—1 1/2d
Nundydroog	9/4 1/2	.....
St. John d'El Rey	31/6	+6d
Zauns	2 1/16	—1/16

Diamonds and Platinum	Price Sept. 12	+ or — on week
Anglo American Inv.	9	.....
Casts	24/9	—4 1/2d
Cons. Diam. of S.W.A.	10/9	.....
De Beers Defd. Regd.	5 1/2	.....
De Beers Pfd. Regd.	13 1/2	.....
Pots Platinum	14/-	+1 1/2d
Waterval	23/-	—3d
Copper		
Bancroft	48/6	—1/6
Chartered	72/-	.....
Esperanza	3/-	—1 1/2d
Messina	8 1/2	+1/2
Nchanga	13 1/16	—1/16
Rhod. Anglo-American	5 1/16	—1/16
Rhod. Katanga	40/9	—2/6
Rhodesian Selection	50/3	+3d.
Rhokana	43 1/2	+1/2
Rio Tinto	4 1/16	.....
Roan Antelope	27/7 1/2	—1 1/2d
Selection Trust	4 1/2	+1/16
Tanks	7 1/16	—1/16
Tharsis Sulphur Br.	4 1/16	—1/16
Tin (Eastern)		
Ayer Hitam	20/3	.....
Gopeng	10/-	+3/-
Hongkong	5/4 1/2	.....
Ipoh	25/6	+6d
Kamunting	9/-	.....
Kepong Dredging	3/3	.....
Kinta Tin Mines	15/6	+3d
Malayan Dredging	10/9	+6d
Pahang	12/1 1/2	+6d
Pengkalen	14/9	—9d
Petaling	7/4 1/2	.....
Rambutan	22/-	+1/-
Siamese Tin	10/7 1/2	+4 1/2d
Southern Kinta	15/9	+1 1/2d
S. Malayan	7/4 1/2	—1 1/2d
S. Tronoh	6/1 1/2	+4 1/2d
Sungei Kinta	15/-	+6d
Tekka Taiping	7/10 1/2	+3d
Tronoh	9/6	.....
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	10/6	.....
Beralt Tin	50/-	—3d
Bisichi	4/1 1/2	.....
British Tin Inv.	20/7 1/2	+3d
Ex-Lands Nigeria	2/-	.....
Geevor Tin	16/7 1/2	+3d

Tin (Nigerian and Miscellaneous) contd.	Price Sept. 12	+ or — on week
Gold & Base Metal	1/1 1/2	.....
Jantar Nigeria	4/6	.....
Jos Tin Area	12/3	.....
Kaduna Prospectors	1/6	.....
Kaduna Syndicate	2/-	.....
London Tin	9/1 1/2	+3d
United Tin	1/-	.....
Silver, Lead, Zinc		
Broken Hill South	63/-	+6d
Burma Mines	4/3	+1 1/2d
Consol. Zinc	66/3	+1/10 1/2
Lake George	14/4 1/2	+4 1/2d
Mount Isa	25/3	+1/9
New Broken Hill	48/6	—2/6
North Broken Hill	105/6	+4/6
Rhodesian Broken Hill	11/3	+3d
San Francisco Mines	26/9	+3d
Uruwira	4/3	—3d
Miscellaneous Base Metals and Coal		
Amal. Collieries of S.A.	51/3	.....
Associated Manganese	39/-	—3d
Cape Asbestos	9/9	+1 1/2d
C.P. Manganese	23/7 1/2	—1 1/2d
Consol. Murchison	52/6	+1/10 1/2
Natal Navigation	3 1/2	.....
Turner & Newall	104/7 1/2	—1 1/2d
Wankie	17/-	—3d
Witbank Colliery	5	.....
Canadian Mines		
Dome	$27	.....
Hollinger	$52	—1/2
Hudson Bay Mining	$168 1/4	.....
International Nickel	$203 1/2	.....
Mining Corpn. of Canada	£9 7/8	+1/16
Noranda	$123 1/2	.....
Quemont	£9 1/2	—1/2
Yukon	5/1 1/2	—3d
Oil		
Apex	43/9	+6d
Attock	35/9	—3d
British Petroleum	7 1/2	—1/2
Burmah	87/6	—5/-
Canadian Eagle	65/9	+1/6
Mexican Eagle	22/6	+10 1/2d
Shell	7 1/2	—1/2
T.P.D.	47/6	—3d
Ultramar	42/9	+1/6

discouraging that throughput declined by 2,000 tons and a drop in profits to £50,100 from £54,166 took place. But it was a more successful month for Loraine whose losses were decreased to £10,202 from £12,296. This resulted from a boost in milling by 4,000 tons and a drop in costs to 50s. 9d. from 53s. 5d.

West Driefontein stood out in particular amongst mines of the Gold Fields group with profits up to £575,282 from £566,901. This was due to a reduction in costs by 3d. a ton. At Robinson Deep, despite a fall in throughput by 1,000 tons, profits rose to £10,604 from £6,134.

At Union Corporation's St. Helena mine, results were exceptional. This expanding property's mill throughput was stepped up by as much as 4,000 tons to 119,000 tons and costs —already by far the lowest in the O.F.S.—were further reduced by 3d. a ton to 40s. 7d. Although grade remained unchanged, profits moved up to £191,344 from £180,437. Grootvlei managed to treat 5,500 tons more than in the previous month and profits rose to £244,408 from £232,342.

Other mines to show improvements over July results were Blyvoor in the Central Mining Group which milled 5,000 tons more thus raising its profits to £476,126 from £448,372. Harte-beestfontein in the Anglo-Transvaal group milled an additional 1,000 tons and profits rose to £192,529 from £183,297. Virginia's profits also rose to £128,356 from £115,516. At Freddies Consolidated in the J.C.I. group 2,000 more tons were crushed than in July. Costs decreased to 63s. 9d. from 64s. 5d. and working losses to £23,452 from £26,470.

Company	August, 1956 Tons (000)	Yield (oz.)	Profit (£000)	Year ends	Current Financial Year Total to date Tons (000)	Yield (oz.)	Profit (£000)	Last Financial Year Total to date Tons (000)	Yield (oz.)	Profit (£000)
Goldfields										
Doornfont'n	71	28,010	121·9	J	141	55,660	240·0	101	40,288	170·2
Libanon....	98	21,735	57·6	J	197	43,522	111·8	196	42,121	119·3
Luipaards Vl	85	15,368	*12·0	J	170	30,504	*23·6	175	34,731	7·3
Rietfontein .	26	5,749	17·3	D	207	46,927	144·1	212	47,612	157·4
Robinson ..	81	15,424	10·6	D	629	127,222	25·8	660	141,526	156·0
Simmer	102	18,284	19·2	D	814	142,159	130·6	956	159,682	138·3
Sub Nigel ..	67	19,531	60·7	J	133	39,481	125·2	133	42,354	167·9
Venterspost.	125	29,531	71·3	J	252	59,186	143·9	250	58,012	157·6
Vlakfontein.	49	17,236	86·1	D	346	124,515	616·3	309	113,487	584·4
Vogels	100	24,050	75·4	D	803	200,789	696·5	823	212,234	881·2
West Drie ..	75	69,356	575·3	J	150	138,732	1142·2	142	109,154	872·4
Anglo American										
Brakpan ...	109	18,387	14·1	D	856	145,563	103·3	855	145,833	122·2
Daggas	232	52,094	295·8	D	1,758	398,405	2254·8	1,814	414,102	2542·9
E. Daggas..	95	15,560	31·2	D	191	125,645	279·1	769	128,173	373·5
F.S. Geduld	44	18,260	70·6	S	307	113,504	341·1	—	—	—
Loraine	57	10,725	*10·2	S	508	87,964	*250·8	—	—	—
P. Brand ...	58	45,045	377·0	S	592	466,599	3845·6	—	—	—
P. Steyn' ...	93	36,515	222·3	S	954	356,704	2044·6	—	—	—
S.A. Lands .	94	20,897	82·5	D	717	148,319	489·2	756	143,034	448·6
Springs	127	15,309	8·8	D	1,008	122,695	84·9	955	125,374	68·1
Vaal Reefs .	49	17,962	87·5	D	190	66,746	295·2	—	—	—
Welkom....	87	20,962	50·1	S	926	203,975	348·1	—	—	—
W. Holdings	83	36,312	231·0	S	846	338,795	2047·2	—	—	—
W. Reef Ex.	124	25,260	546·0	D	958	292,308	869·1	943	176,948	440·5
Central Mining										
Blyvoor	114	63,756	476·1	J	223	124,672	924·5	226	126,890	971·4
City Deep ..	163	30,987	4·4	D	325	235,103	23·2	1,293	244,658	*6·2
Cons. M.R..	173	23,968	11·2	J	345	47,834	21·6	359	50,029	48·0
Crown	296	43,897	11·1	D	2,300	358,272	211·8	2,407	385,238	400·8
D. Roodep't	190	32,765	56·1	D	1,460	251,779	415·5	1,442	243,138	401·6
E. Rand Pr'p	225	56,931	187·2	D	1,699	438,632	1424·8	1,708	410,285	1285·2
Harmony...	80	31,643	177·1	J	158	62,844	350·2	134	48,609	242·9
Modder E...	143	14,586	9·6	J	283	28,779	18·1	268	27,558	17·1
Rose Deep..	45	6,997	0·1	D	354	57,084	8·1	477	74,241	58·2
J.C.I.										
E. Champ ..	13	631	*26·3	D	114	7,375	*214·8	159	12,663	*263·1
Freddies C. .	61	13,344	*23·5	D	489	98,347	*307·3	659	106,588	*385·3
Govt. G.M..	231	30,111	0·2	D	1,900	239,448	15·9	2,042	257,918	145·9
Randfontein	234	21,238	*334·8	D	1,941	184,783	*2313·8	2,048	232,246	*2653·2
Union										
East Geduld	151	46,417	336·8	D	1,154	356,359	2540·6	1,194	367,168	2769·4
Geduld Prop	107	16,919	31·7	D	832	132,318	264·6	817	133,061	361·1
Grootvlei...	206	44,076	244·4	D	1,564	337,187	1836·4	1,550	335,307	1947·8
Marievale ..	74	19,420	91·2	D	569	149,315	689·2	571	147,817	710·0
St. Helena ..	119	34,342	191·3	D	848	246,250	1331·9	833	216,193	1032·4
Van Dyk ..	82	13,216	1·9	D	643	104,365	12·3	642	106,153	14·7
General Mining										
Ellaton....	32	7,040	20·3	D	256	59,349	232·8	244	71,835	350·6
S. Roodep't.	30	6,926	25·6	J	59	13,690	50·3	56	12,474	44·7
Stilfontein .	91	34,945	211·8	D	709	277,832	1643·5	671	263,364	1655·1
W. Rand C.	245	25,536	*90·2	D	1,892	193,968	*760·8	2130	221,699	3·2
Anglo-Transvaal										
Harteb'tf'n	67	32,663	192·5	J	133	64,508	375·8	90	32,729	130·2
Merriesp't .	75	18,000	42·9	D	450	105,739	271·6	—	—	—
N. Klerksd'p	11	1,286	*4·6	D	86	9,911	*40·6	90	11,217	3·5
Rand Leases	184	28,152	7·1	J	368	56,304	11·7	382	60,452	77·5
Village M.R.	33	5,075	8·9	J	68	10,185	17·9	69	10,147	19·5
Virginia ...	87	20,280	53·5	J	173	40,189	105·0	130	27,949	43·9
Others										
N. Kleinf'n .	104	12,390	0·5	D	843	99,205	16·5	862	102,249	45·2
Wit. Nigel ..	18	3,975	7·1	J	36·5	7,978	14·5	36	7,938	16·4

* Indicates loss.
Note.—Profit includes sundry revenue but excludes earnings from uranium, pyrite, etc.

Company Shorts

New Broken Hill's Drilling Results.—In order to confirm results obtained in Borehole 514, New Broken Hill Consolidated has drilled a further hole No. 521 horizontally from co-ordinates 1,250 ft. south and 172 ft. east on a bearing of 241 deg. on No. 21 level. The following results were obtained: An intersection from surface level to 19 ft. revealed 15.4 per cent lead, 2.8 oz. of silver per ton and 18.1 per cent zinc. Between 93 and 118 ft. an intersection of 25 ft. gave 20.2 per cent lead, 4.0 oz. of silver and 16.6 per cent zinc. Between 169 and 307 ft. an intersection of 138 ft. revealed 23.7 per cent lead, 5.9 oz. of silver and 21.3 per cent zinc. The last quoted intersection of main ore is approximately 120 ft. north of the principal intersection in Borehole 514. Normal development work and drilling on this western mineralization is now proceeding.

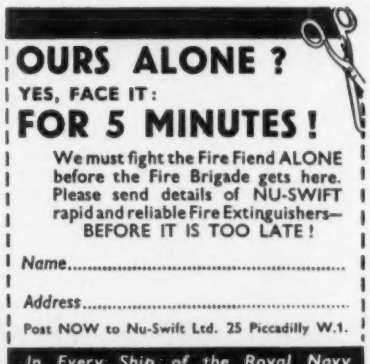
Capitalization of Reserves by Mountain Copper.—In order to bring the capital of The Mountain Copper Company more into line with assets employed, reserves totalling £500,000 are to be capitalized by issuing 5,000,000 shares of 2s. each fully paid. Thereafter, the new shares will be consolidated into 2,500,000 shares at 6s. each fully paid. The consent of H.M. Treasury for these proposals has been obtained and an extraordinary meeting was held on September 6.

Mountain Copper's consolidated balance sheet at December 31, 1955, showed total assets of £2,073,325 against £1,581,511 at the end of the previous year. Current assets of £788,256 exceeded current liabilities by about £564,000.

Nigerian Electric Pays 6 Per Cent Final.—The Nigerian Electric Supply Corporation has recommended a final dividend of 6 per cent on its issued ordinary capital of £743,181 as increased by the recent 1 for 4 scrip issue. Total distribution for the year ended February 29, 1956, thus totalled 10 per cent. For the previous year the same total on a smaller capital was equivalent to 8 per cent. The company's net profit before taxation of £141,870 compares with the previous figure of £111,358.

Komata Reefs Again Pays 12½ Per Cent.—A dividend of 12½ per cent tax free on its issued ordinary capital of £21,281 in 2s. shares has been declared by Komata Reefs Gold Mining in respect of the year ended March 31, 1956. The same distribution was paid for the year 1955. It is expected that the company's accounts will be published about the middle of September and the meeting held early in October.

Transvaal and Delagoa Pays 5 Per Cent More.—With the recommendation of a final dividend amounting to 32½ per cent the Transvaal and Delagoa Bay Investment Company has raised its total distribution for the year ended August 31, 1956, to 55 per cent. During the previous year distribution totalled 50 per cent.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The forty-third annual general meeting of Geevor Tin Mines, Ltd., was held on September 12 in London.

Mr. G. W. Simms (the chairman) presided, and the following is an extract from his statement for the year ended March 31, 1956 :—

The profit of £100,353, together with £10,429 brought forward, provides a credit of £110,782, out of which the Directors recommend the payment of a final dividend of 1s. 6d. per stock unit, which, with the interim dividend of 9d. per unit, will make a total distribution for the year of 2s. 3d. per stock unit, less income tax.

The tonnage of ore mined was 57,839 tons, which after sorting out 2,395 tons of waste rock yielded 55,444 tons to the mill. Of this 55,404 tons were milled and yielded 652 tons of black tin (65% Sn.), an average recovery of 26.36 lbs. of black tin per ton of ore milled. As compared with the previous year, both the tonnage milled and the average recovery per ton are slightly higher.

In my last annual Address I expressed the opinion that the long-term outlook for tin is good and I see no reason to alter that opinion. Unfortunately Government's attitude as regards taxation of the Cornish Tin Mining Industry shows little appreciation of the possibilities of further developing that industry to the advantage of the Country as a whole. With the example of tax concessions recently given by a small country like Eire before the Government and the immediate beneficial results to that country which followed those concessions, it is surprising that no provision for similar relaxation was made in the current Finance Act, but it is to be hoped that when Government has further time to consider the position as regards future development of the Cornish Tin Mining Industry that it will take the necessary action to make such development possible. In so doing, it would cost the Country nothing and would undoubtedly produce considerable ancillary benefit by way of revenue and would increase the home supply of a very important mineral.

The report was adopted.

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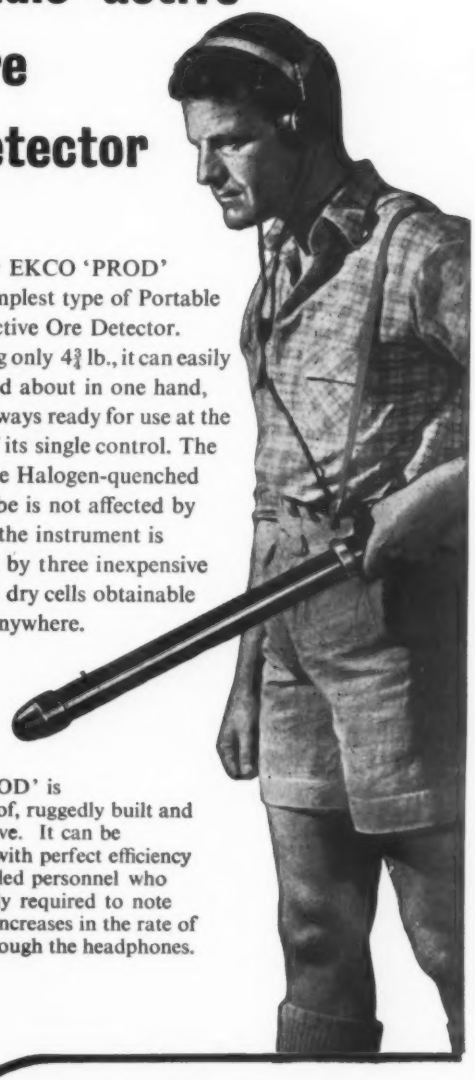

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FURTHER RECORDS ACHIEVED

HEAVY CAPITAL EXPENDITURE PROGRAMME

MR. J. F. E. d'A. WILLIS ON THE EXPANSION PLANS

The Thirty-second Annual General Meeting of the Indian Copper Corporation Limited was held on September 12 in Calcutta, **Mr. J. F. E. d'A. Willis, O.B.E.**, the chairman, presiding.

The following is his address :—

The results achieved, as you will observe from the profit and loss account, far exceed those for the previous year which have hitherto constituted a record in the annals of the corporation and are directly attributable to the consistent rise in the world price of copper. The maintenance of a high production standard and satisfactory despatches also played an important part in achieving these results. Although these high world prices for copper continued into early 1956, there has since been a rapid decline to approximately two-thirds of the peak reached.

ACCOUNTS

Before proceeding to a detailed survey of the accounts, I would draw your attention to a change which has been made this year in the grouping of the fixed assets in the balance-sheet. On this occasion those items which are allowed for statutory depreciation have been amalgamated, while mining rights and permanent works, on which depreciation is not allowed at present, continue to be shown separately.

The profit for the year, before providing for taxation, depreciation, and reserves, amounted to £1,474,804, as compared with £898,382 in 1954. Provision for taxation at £683,046 includes £47,424 for taxation on the dividend and bonus for the year 1954 paid in 1955, and on the interim dividend for 1955 paid in February, 1956, together with a provision of £47,424 for taxation on the proposed final dividend and bonus for the year 1955.

Full provision has been made for depreciation and £200,000 has been allocated to general reserve, as against £150,000 last year. Although the liquid resources of the corporation are at present satisfactory, further heavy capital expenditure is anticipated during the next few years in order to develop the mine.

After making these provisions there remains a sum of £416,758 to which has to be added £111,715 brought forward from last year, giving a total of £528,473. Out of this your directors are pleased to be able to recommend the payment of a final dividend of 10 per cent and a bonus of 25 per cent, both free of income tax which, together with the interim dividend of 10 per cent, absorbs £411,390 leaving £117,083 to be carried forward to next year.

With the rapid decline in the world price of copper, the results for the current year, although so far satisfactory, are unlikely to approach those for 1955.

In order that the issued capital of the company might be brought more into line with the capital employed in the business, an application for the capitalization of a portion of the reserves of the company was submitted to the Government of India and her Majesty's Treasury, United Kingdom. An issue of one unit of stock for each two units held has since been sanctioned.

COPPER LEASES AND OPERATING RESULTS

A detailed review of the year's operations is given in your General Manager's Report, which may be seen during office hours at the company's head office. The production of refined copper at 7,281 long tons was a record in the corporation's history. Despatches were good and operating costs satisfactory, although slightly higher than the previous year.

DEVELOPMENT AND ORE RESERVES

Lateral development was again restricted, but development in depth continued satisfactorily.

Although the estimated reserves now stand at 3,330,090 short tons as compared with 3,369,286 short tons at the end of the previous year, this is considered satisfactory in the circumstances of restricted lateral development. Good progress is being made with the development in depth, which should eventually provide extensive lateral development, resulting in a substantial increase in ore reserves.

SALES

In spite of the high price of copper the demand was good and prices increased accordingly. The demand for brass sheets, however, remained steady with a less spectacular rise in price. The average selling prices of the company's products during the year, as compared to the previous year, were as follows :—

	1955 per ton	1954
Copper Ingots	£309	£233
Rolled Brass	£245	£230
Yellow Metal Circles	£266	£241
Rolled Copper	£357	£288

KYANITE

The export of this ore continued to be unrestricted, which permitted larger despatches amounting to 19,234 tons as compared to 12,012 tons in the previous year. The demand in world markets was satisfactory and the export price maintained at approximately £20 per ton F.O.B. Calcutta.

The civil suit brought by the Bihar Government against the Corporation for alleged breaches and forfeiture of the lease, claiming Rupees One Crore damages, together with the civil suit brought by the company against the Bihar Government for specific performance to renew their lease which expired on January 31, 1955, were made analogous and came up for hearing in the Subordinate Judge's Court, Patna, during August, 1955. The hearing of the case was completed in early February, 1956, and judgment delivered in favour of the company in both suits in early May, 1956.

LABOUR

The rivalry between the unions at the mines and works continues and a number of lightning hartals with one strike of 24 hours at the mine took place. The Mosaboni Union submitted a strike notice in May as a result of which their demands were, by agreement between the Corporation and the union, submitted to adjudication, with the proviso that the award on such adjudication would be made binding on both parties for three years. Up to date the tribunal proceedings have not taken place.

GENERAL

In conformity with the underlying principles of the second five-year plan, an extensive programme of prospecting and development has been prepared and is already well advanced. This expansion programme is aimed at increasing considerably the present output of the mines and whilst no immediate results can be anticipated, it is hoped, provided the results of the present exploration are satisfactory, that by the end of the present plan your company will have substantially contributed towards making India less dependent on imports of this important metal.

During the year under review considerable development in depth has been effected in the existing Mosaboni Mine, utilizing the newly constructed circular shaft to which my predecessor referred in his address last year. Development in depth on the scale at present envisaged will permit of extensive lateral development, but only to the extent as will counteract the diminution of ore reserves at the adjoining Badia Mine whose life is limited. Any expansion in output, therefore, must be derived from other areas and it is with this in mind that prospecting on an extensive scale is in progress to the north of the present working area.

With the Government of India's recent industrial policy announcement, it is satisfactory to note that existing industries in Schedule A, which includes copper, will be permitted to remain in the Private Sector and that this does not preclude their expansion.

STAFF

A very high standard of efficiency has again been maintained both at the mines and the works and our thanks are due to all members of the staff for the excellent service they have rendered to the Corporation.

The report was adopted and, the formal business having been transacted, resolutions were passed increasing the capital from £1,000,000 to £2,000,000 and approving the one-for-two share issue.

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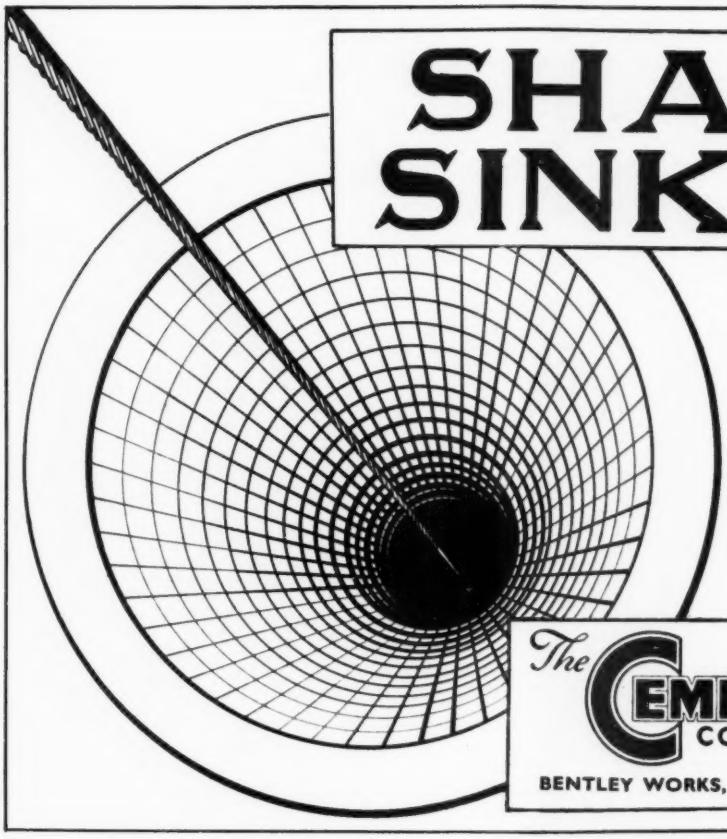

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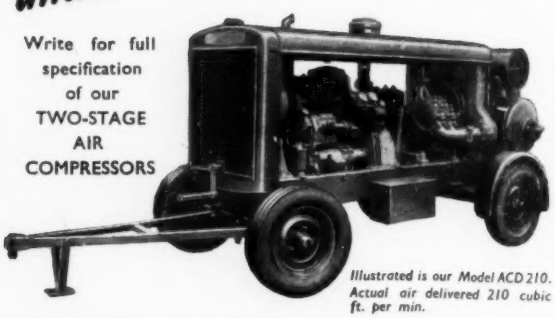

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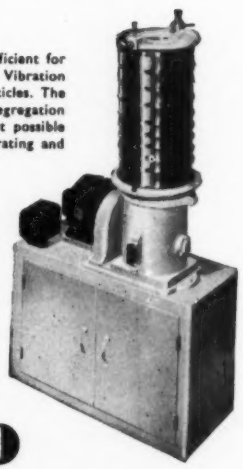

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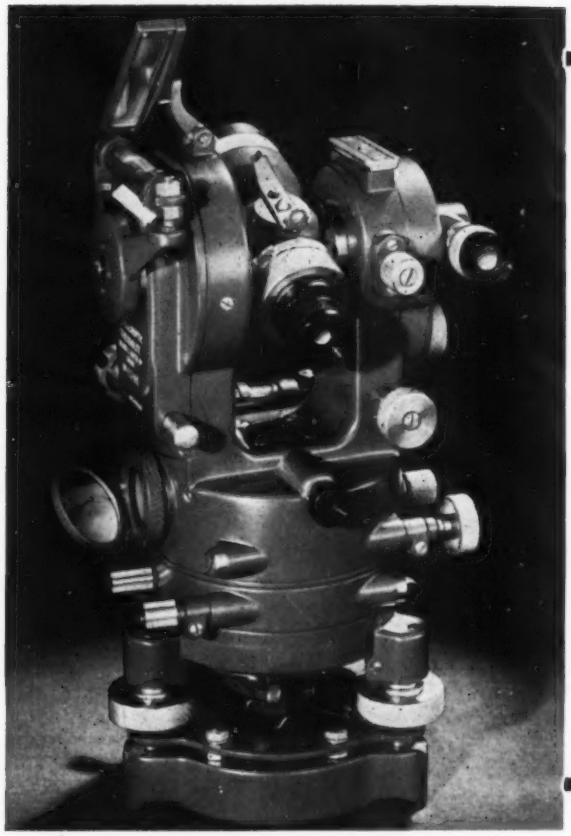

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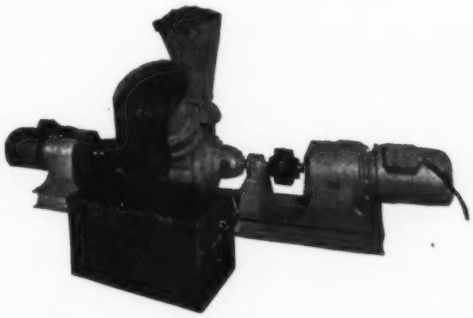

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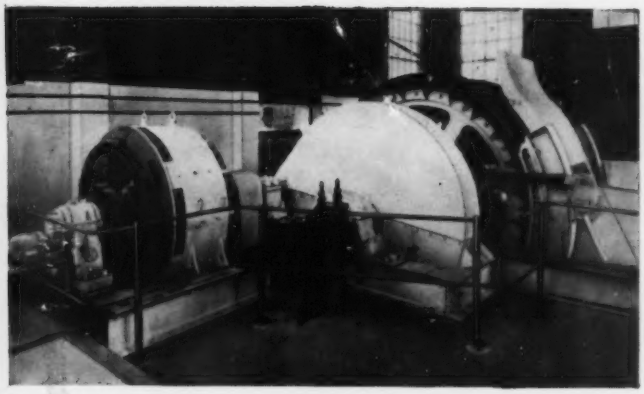
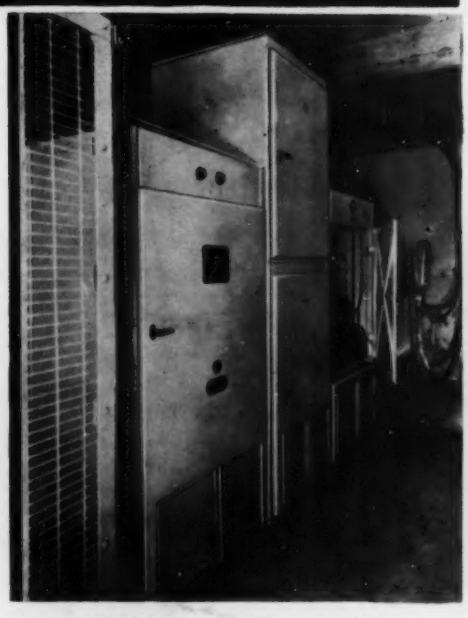
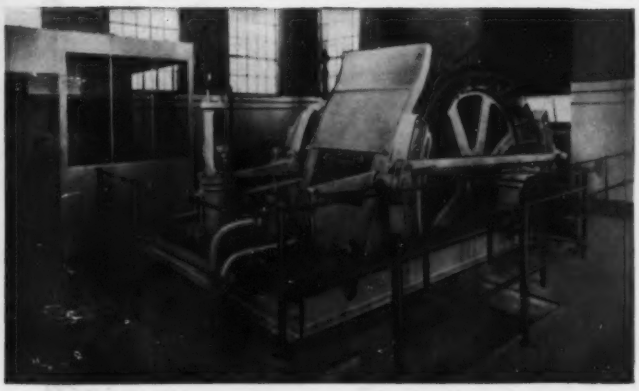




Winders



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